MOTOR AGE

A CHILTON PUBLICATION

DEVOTED TO THE INTERESTS OF THE INDEPENDENT SERVICE STATION

British Captain Euan Wallace (left) and Lord Saltoun inspect the latter's electric car during a display of such vehicles in London. In order to conserve the supply of gasoline the English are encouraging the use of electric vehicles during war time.

MARCH
1940

TOUGH
BUT
OH SO GENTLE

TOUGH on Oil-Pumping • *GENTLE* on Cylinder Walls

You'll look a long while to find the motor condition Steel-Vent can't handle. It's the right ring for any job from rebores to .025 tapers. Not only does it stop oil-pumping . . . Steel-Vent actually reduces the rate of cylinder wall wear. No wonder this sensational piston ring has scored such nation-wide acceptance; no wonder it is bringing so many new customers to car-dealers and garagemen.

HASTINGS MANUFACTURING COMPANY, HASTINGS, MICHIGAN

Piston Rings • Piston Expanders • Valv-Rings

HASTINGS

STEEL-VENT PISTON RINGS

U. S. Patent No. 2,143,797

Stop Oil-Pumping • Check Cylinder Wear

Du Pont Announces ZEREX

A NEW ETHYLENE GLYCOL ANTI-FREEZE

"Zerex"-"Zerone" combination is a golden opportunity to profit-minded dealers

"It's new and it comes from Du Pont"—an unbeatable consumer appeal for any product. That's why you're going to find "Zerex" a blinger for sales next winter—and that's why you should place your order early.

"Zerex" is a non-evaporating glycol base anti-freeze and anti-rust, made to a special Du Pont formula, with distinctive ingredients to protect the cooling system against rust and corrosion.

"Zerex" won't boil off. It won't seep, creep or leak from a *tight* cooling system. It is made for drivers who can be satisfied only by a higher-priced anti-freeze.

"Zerex" will be easy to sell. Here's why: (1) It is a Du Pont product and (2) Du Pont will tell the "Zerex" story to your customers and to millions of other car owners, in national magazine advertisements, in leading local newspapers, on outdoor posters, and in radio broadcasts. Du Pont will also supply complete and most attractive promotional and point-of-sale material.

$2.65 A GALLON . . . 70¢ A QUART

And what about "Zerone" sales and dealer profits next winter?

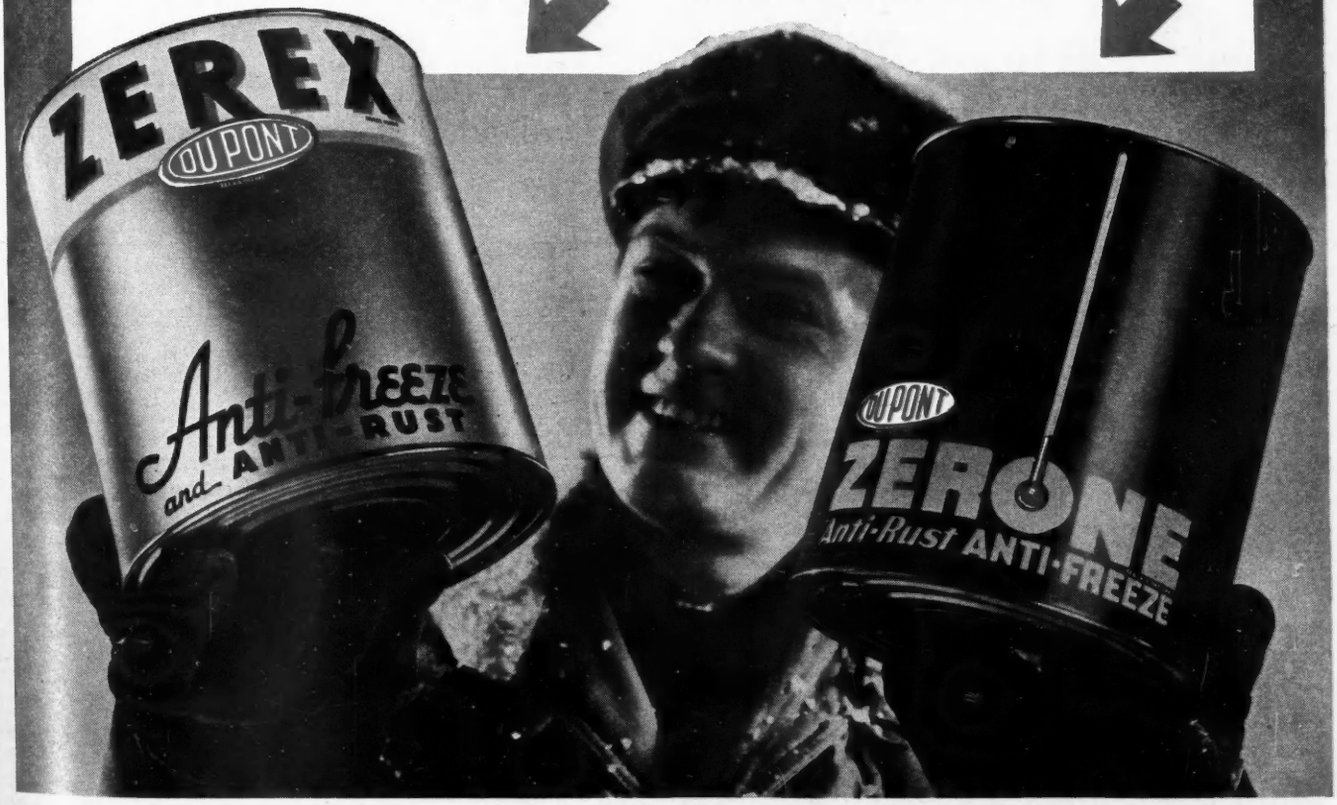
They'll be bigger than ever. It's an old "Zerone" custom! In six years' time, "Zerone" has become the largest selling anti-freeze.

Why? Because "Zerone" is the proven anti-freeze for average driving. Ideal for those who can satisfy their needs with a low-priced product.

The materials from which "Zerone" is made are so effective that surprisingly little is needed. Replacements are small. "Zerone" in a clean cooling system prevents rust and corrosion, gives better engine heat transfer, hence better engine performance. And scientific tests prove that "Zerone" would keep water from freezing solid even at 215° F. below zero!

There will be no let-down in "Zerone" promotion. Advertisements in leading magazines and newspapers and on outdoor posters will again next season tell the motoring public all about "Zerone" anti-freeze. Place your pre-season order now for "Zerone" and "Zerex." Call your jobber about this new anti-freeze proposition.

$1.00 A GALLON . . . 25¢ A QUART



DU PONT ON THE AIR—LISTEN TO "THE CAVALCADE OF AMERICA" TUESDAYS, 9 P. M. E. S. T., OVER NBC NETWORKS

MOTOR AGE

DEVOTED TO THE INTERESTS OF THE INDEPENDENT SERVICE STATION

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MOTOR AGE

MARCH 1940

Shop Talk

Don't Forget

The next issue—April—is the Annual Spring Service and Tune-Up issue of MOTOR AGE. Remember to be on the look out for it as it is going to be chuck full of important tune-up and short cut material on the 1940 jobs. You will want to keep it handy.

False Whiskers

Have just taken off my disguise, which I put on at least once each year, when I go out into the highways and byways and sell MOTOR AGE and the Chilton Flat Rate and Service Manual. It's great experience. The first time I went out, I told them I was ye editor and found that I spent about 90 per cent of my time shooting trouble and never got any ideas on how to improve the books. However, when I travel as a subscription salesman, there is no time lost and I soon learn what the readers like and, what is of equal importance, what they don't like. It seems that the Clearing House is still by far the best liked section of MOTOR AGE and the picture service stories are running a close second. On the other hand, general articles dealing with management don't go over so well.

Bad Idler

Timing gears, says Tex Bullis of Palisade, Minn., are the reason for the bad idling on a model A and experienced by Verner Toney and Aubry Bentley as described in the February issue. The reason I gave was a defective distributor shaft, but you may be right, Tex.

Assist

Pete Keeling, whose letter head proclaims that he does expert repairing on all makes of cars in Franklin, Ind., is credited with an assist in connection with the trouble Don Hollingshead was having with a Chevie that pulled into his shop in Archbold, Ohio. The difficulty was an oil leak from the distributor shaft. Pete supplied all the data with drawings, showing just where to drill a 5/32 in. hole to overcome the trouble. Thanks a million, Pete.

Tip

From way out in Shelby, Mont., Amos LaFrance comes to my assistance with a suggestion on how to eliminate static electrical charges in a car. Says Amos, for a quick job take a soft lead pencil and make eight to ten marks from the rim of the wheel to the surface of the tire. These marks should be on the inside where they won't affect the appearance of the car. The lead pencil mark, which is graphite, makes a path for the current to leak from the car to the surface of the road. Thanks, Amos, for the tip. Anyone else got any suggestions?

Bill Toboldt

Checking CURRENT and VOLTAGE REGULATORS

A reference article on the Delco-Remy units used on '40 models

BY
WILLIAM H. CROUSE
SERVICE DEPT., DELCO-REMY

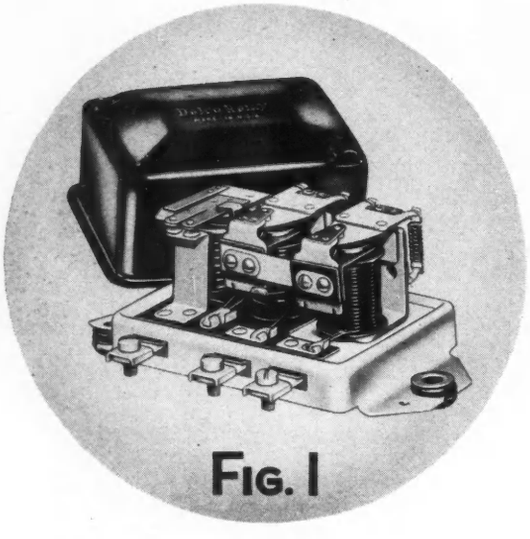


FIG. 1

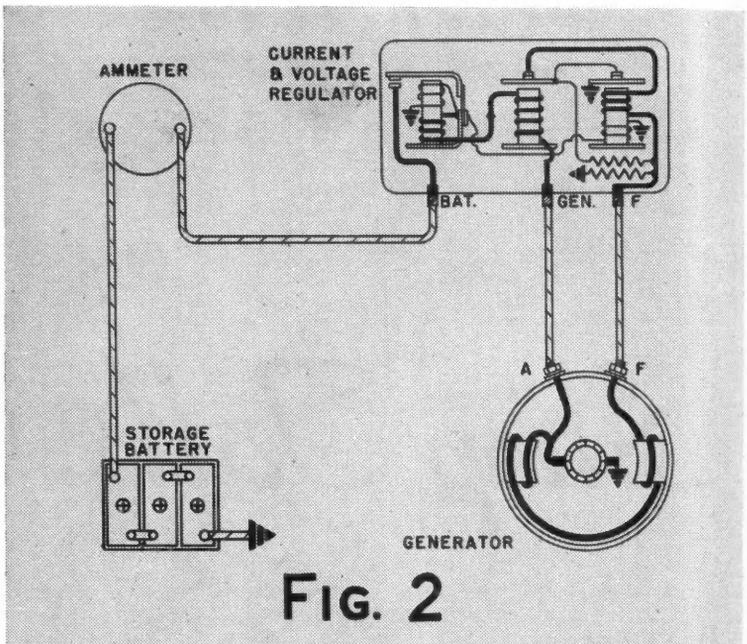


FIG. 2

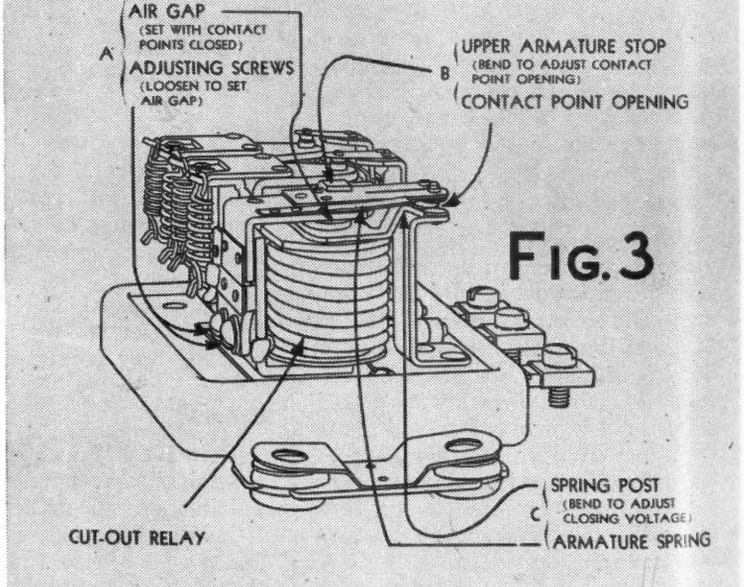


FIG. 3

CLEANING REGULATOR CONTACT POINTS

Cleaning the regulator contact points is one of the most important operations to be made on the regulator. Dirty or oxidized contact points cause low generator output and run-down batteries. If the points are properly cleaned, the regulator will be restored to normal operation. But if improperly cleaned, whatever improvement there is will be temporary. To clean the points, remove the upper contact support as illustrated in Figure 8. Use a clean, fine-cut contact file, and clean each point separately. Do not use the file excessively on the rounded (smaller) point. NEVER USE SANDPAPER OR EMERY CLOTH TO CLEAN THE CONTACT POINTS. If the flat point is pitted, clean out the cavity with a "spoon" or riffler file. Be sure the cavity is cleaned out enough so that good clean contact is made between the points. Reassemble the contact supports and insulators as illustrated in Figure 8, making sure the insulators are correctly located. Adjust Air Gap. (Figure 6.)

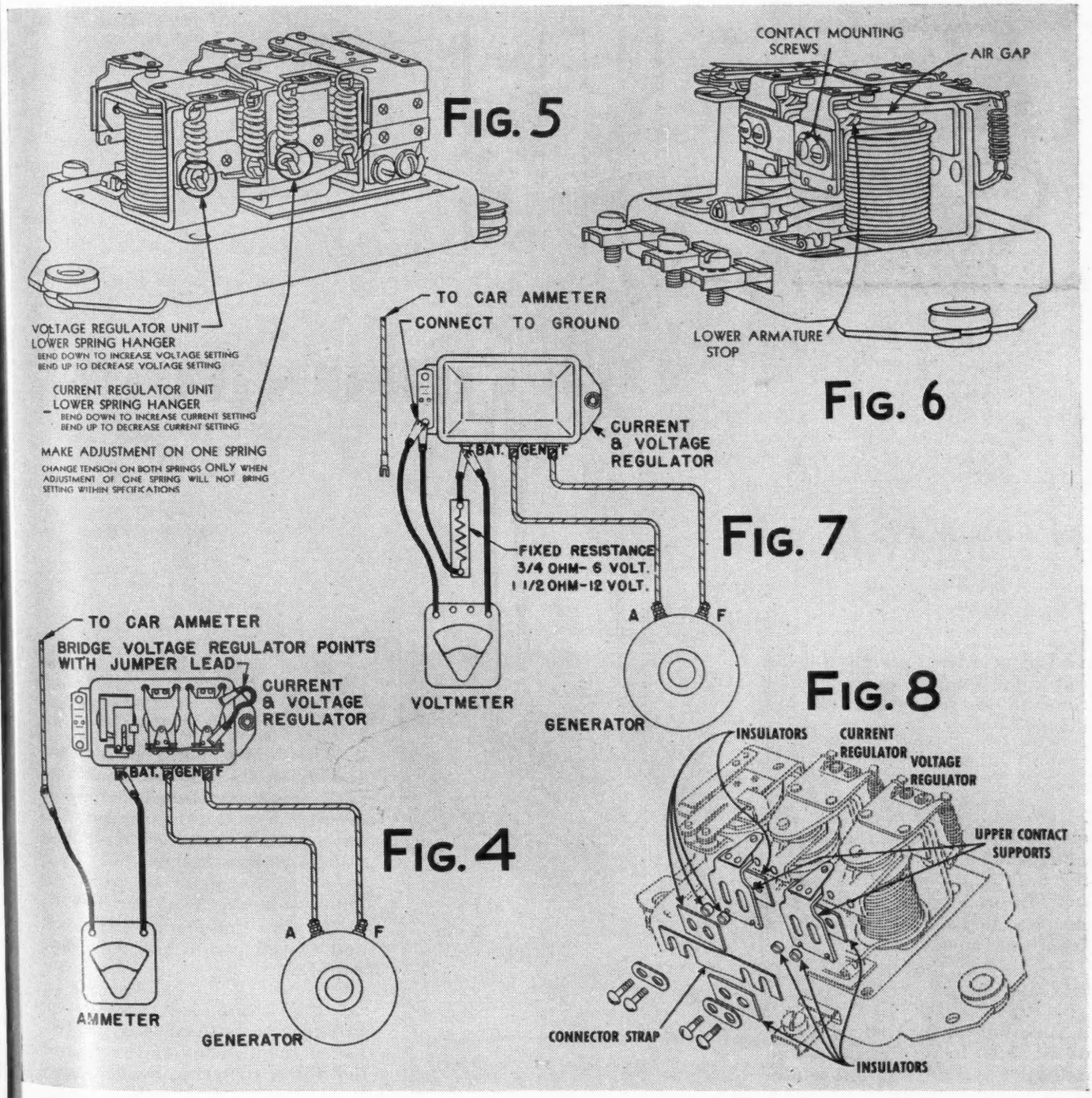
RADIO, heater, the new sealed beam lights, and other electrical units on today's motor cars are an old story to service men by now. We all know how, to meet the higher current demands of these units, higher output generators were introduced. However, we may not all be quite so familiar with the new current and voltage regulator (Figs. 1 and 2) which Delco-Remy is supplying for use with the new Delco-Remy passenger car generators. Let's take a look at these, so we'll be able to handle any service on them which comes our way.

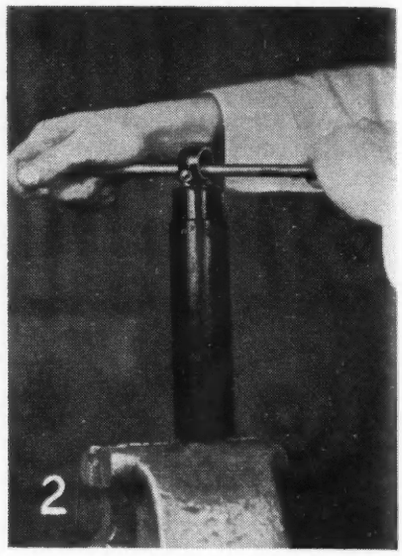
We all know it, but it won't do any harm to repeat that these regulators are precision built units, and must be adjusted to thousandths of an inch and tenths of a volt. Adjustment to within half a volt or a hundredth of an inch isn't going to be accurate enough; it means trouble for the fellow who sets them no closer than that.

With the right instruments and gages, adjustment is easy, and guesswork eliminated. A gage package (No. 37) containing the necessary gages and a regulator adjusting tool is available through United Motors Service. The use of a heavy duty ¾ ohm fixed resistance as described later simplifies the adjustment of the voltage regulator. This is also available through United Motors Service. Of course, your ammeter and voltmeter must be accurate, because these new generators are capable of up to 34 amperes, and it wouldn't do the battery or the other electrical units any good if that amount of juice got loose in the electrical system.

As we all know, there are three separate units in the new regulator, and each must be checked and adjusted separately. They are the

(*Continued on page* 59)





Servicing the MONROE SHOCK

By BOB HANKINSON

PHOTOS TAKEN AT

1. Remove drain plug and drain out fluid. Pump the shock a few times to be sure all the fluid has drained out.

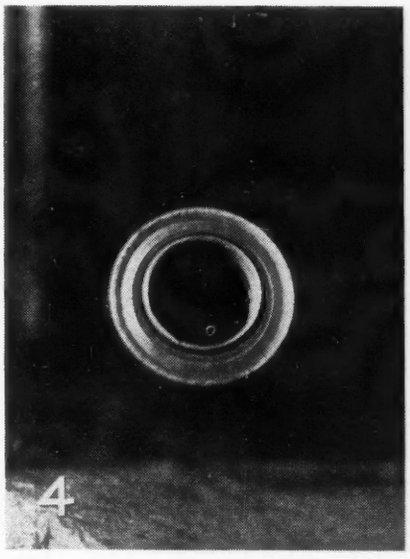
2. Clamp the upper eye in a vise and collapse the unit, turning the outer shell until the stud enters the hole in the piston rod bushing. Insert a bar in the eye and unscrew the piston rod bushing from the inner shell.

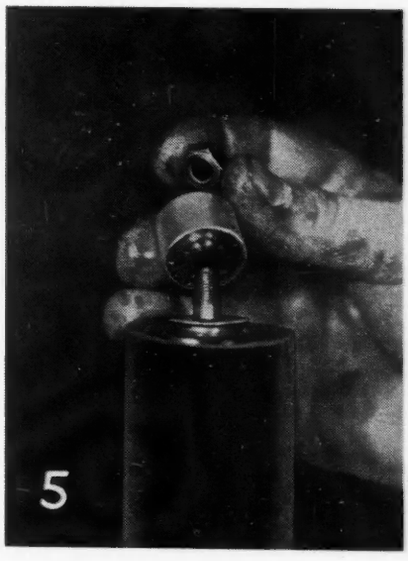
3. Lift the inner shell from the outer shell, being careful not to damage the fluid seal and retainer assembly when lifting the two shells apart.

4. The fluid seal and retainer assembly in the end of the inner shell. If this retainer is damaged or worn the shock absorber will have to be replaced, as the seal is welded to the shell.

5. Remove nut from piston rod and lift off piston and valve assembly.

6. Right to left, in order of removal from piston rod: nut, relief valve, metering washer, pis-





ABSORBER

LACY REDD & CO., INC., PHILADELPHIA, PENNA.

ton, intake valve, intake valve star spring, piston support washer.

7. After reassembly, clamp lower end of unit in vise, collapse unit and pour correct amount of fluid in filler cup attached to filler hole. Extend and collapse unit with slow pumping action until all fluid has been drawn in, and all air forced out. Install filler plug.

8. Install new rubber grommets or bushings in each eye, coating with liquid soap to aid in installation.

By
A. E. HOLDEN

REPAIRING FARM TRACTORS

A source of steady income for the shop that's willing to go after the business

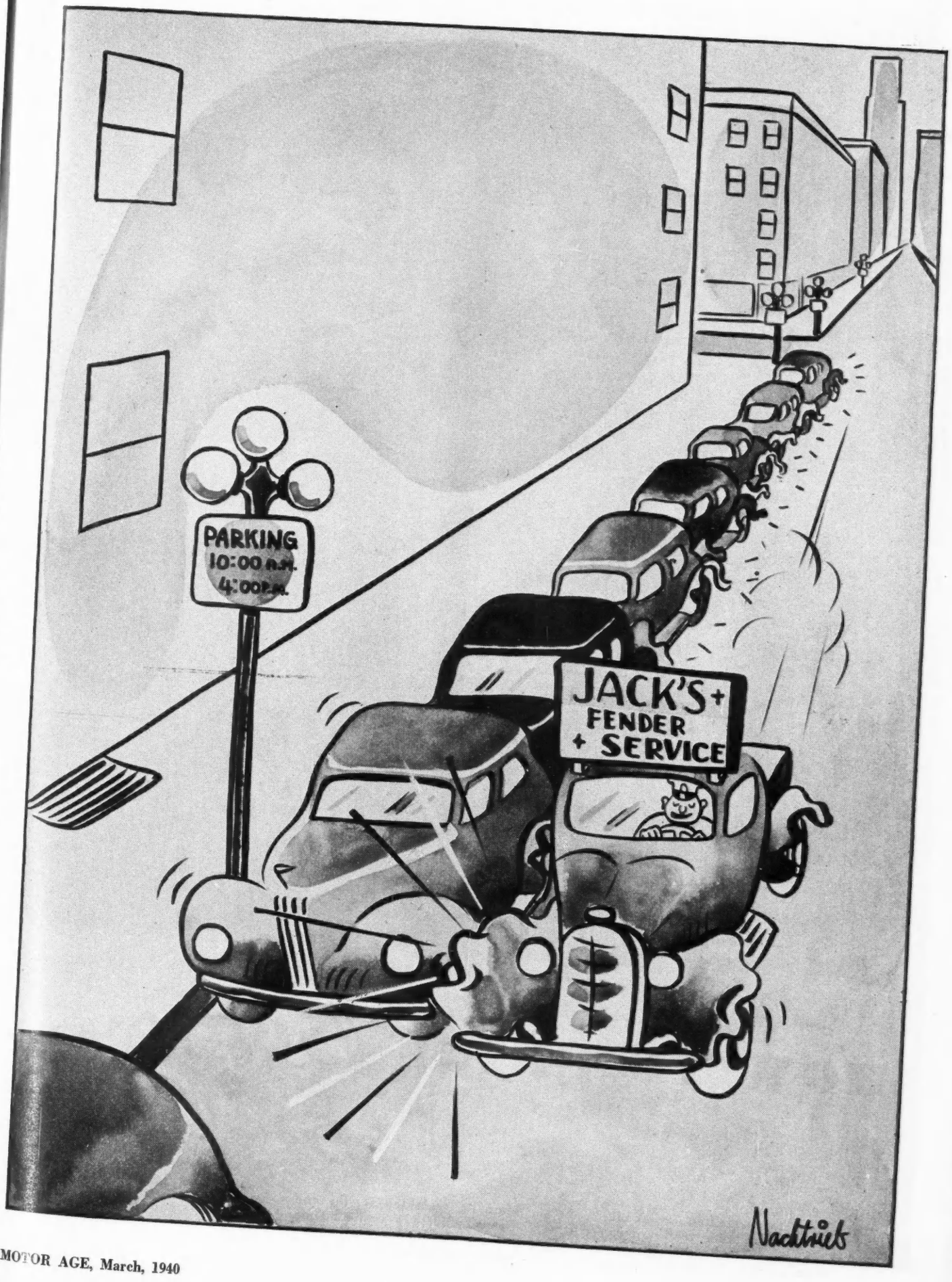
WHAT is this new giant industry that is swiftly revolutionizing farming? What does it offer *today* in plus profits for the automotive maintenance operator? What does the *future* hold in store for those who pioneer in this new field?

Lester Eidenier, proprietor of the East End Garage in the small town of Pioneer, Ohio, consented to answer these questions from his many years of experience in this new development, which began to take root for a solid growth back in the days of the Fordson farm tractor, first in the lower price range.

"Like the automobile, farm tractors were beyond the reach of most farmers when they were first introduced. As head mechanic at our local Ford agency, I came in direct contact with all the Fordson buyers around our community, and as the product became more popular, naturally, it wasn't long before a hundred or more farmers were using them. These machines, while performing the work for which they were designed, naturally required frequent service. Motors had to be overhauled, valves ground, rear systems reconditioned, spark plugs replaced, and all the other services common to automobiles. You see, while tractors never operate in the fields with the high speed of automobiles on the highways, there are certain other disadvantages which tend toward wear—the accumulation of dust and grime from the fields."

Six years ago Eidenier resigned from the car agency and opened his own shop, operating as the East End Garage. Eidenier contacted all his old friends and customers by personal visits, newspaper announcements and direct mail advertising. His business, exclusively repairing and reconditioning of

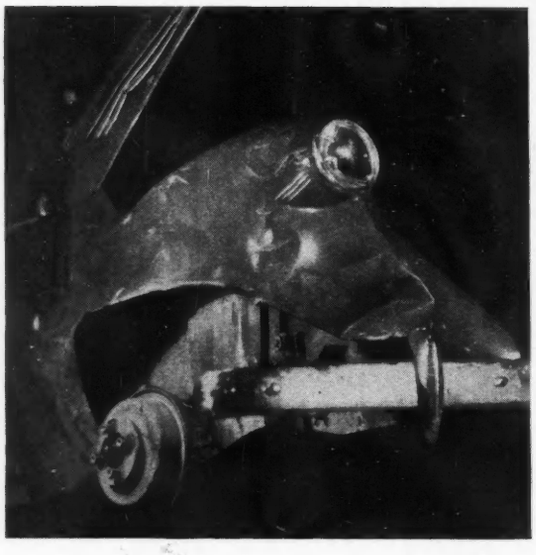
(*Continued on page* 54)


PARKING
10:00 A.M.
4:00 P.M.
JACK'S
FENDER
SERVICE
Nachtrieb

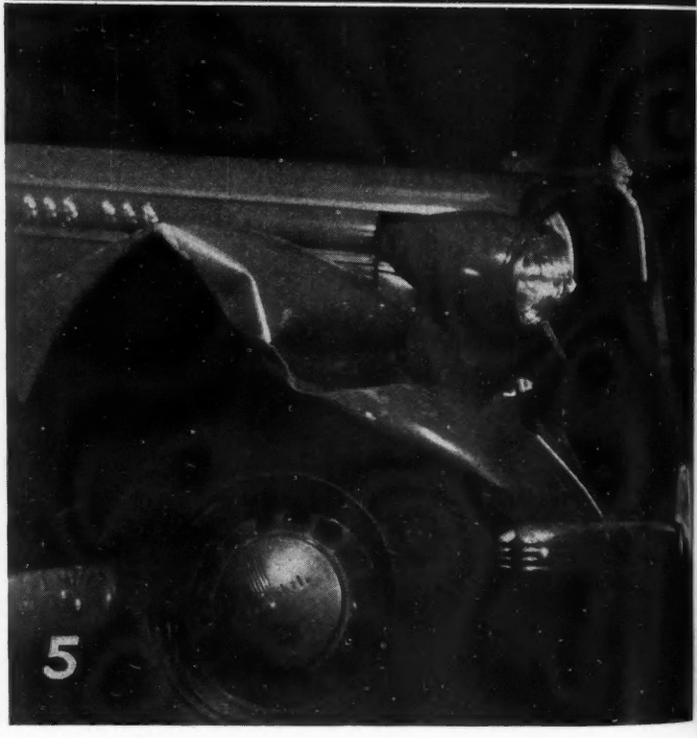
HOW TO PRICE *Body* and

By ***BOB HANKINSON***

This Motor Age feature is designed to enable mechanics to make accurate estimates on repairing damaged fenders and bodies. As every shop worker knows, estimating body and fender repairs is most difficult. No one has been successful in publishing any flat rate prices on fender and body repairs because no one has been able to answer the question "how big is a dent?" However, with the unretouched photographs in this series to act as a guide, together with the time required for straightening and refinishing, it is possible to make accurate estimates.



1. Install new fender. The cost of refinishing and straightening the fender is greater than the cost of a new fender.



PHOTOGRAPHS TAKEN AT

2. Time to straighten trunk lid lower panel, rear fender, body side panel and rear bumper, 8 hours. Refinishing time, 2 hours.

3. Time to straighten fender and repair grille, 2¼ hours. Time to spot in fender instead of completely refinishing, ½ hour.

4. Time to straighten door panel, four hours; refinish, two hours. Time to straighten rear fender, three hours; refinish, one hour.

Fender REPAIRS

PAUL BROS., PHILADELPHIA, PA.

5. Time to R&R fender, straighten, 8 hours; refinish, 2 hours. Straighten radiator shell, install new grille, 3 hours; refinish, 1.

6. Time to straighten fender, one hour; not necessary to R&R. Time to spot in fender, instead of completely refinish, ½ hour.

7. Time to R&R, straighten fender and headlamp shell, six hours. Time to refinish fender and headlamp shell, 1¼ hours.

BRING IN THE GALS

Be sure you're getting your share of the business brought into shops by the women

By ROSE LU GOLDMAN

ARE you getting your share of the business that's to be had from America's women drivers? If your answer is "No," well, it's an indication of untilled ground that *might* be developed into new business for you. It's a considerable amount of new business, too, for we girls drive one-quarter of the cars on the road today.

Of course, you may already be well aware of these new business opportunities, but aren't sure exactly where to locate them—how to contact the women and start them coming your way. With the "forty-niner" you can say "There's plenty of gold in them thar hills," and with him also, "but how do you know where to strike it?" You can't very well blast away the whole mountain.

Well, these women—a good percentage of them, anyhow—are family chauffeurs. They drive hubby to the 8:02; they take the youngsters to school; they do the marketing; run errands, go to the bank. They drive to friends' homes for luncheon and bridge, and finally wind up their day meeting the 5:57. In their busy lives the car plays an indispensable part.

Among other things they must see that it's kept in running order—that it isn't going to take a notion not to move and leave them "stranded in the midst of plenty" to be done.

Where do they go for this repairing and attention? Well, that depends on a number of things. They're probably returning to the place where they bought the car unless repeatedly bad service has driven them elsewhere; in which case it will be to someone that "did a good job for Jane when her car acted this same way." Oh, it's a miserably inconvenient place, all right, but where else is there? It would be nice if there were a good

(*Continued on page* 38)

INSTALLING *Governors*

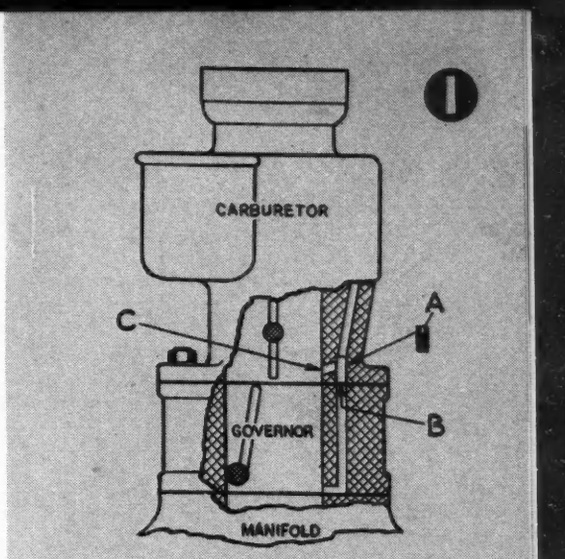


Fig. 1. Use drilled screw A in opening B to close channel C on Zenith models 180, 20, 250 96-EVT and Stromberg models SF 2-3-4-5, DX 2-3-4.

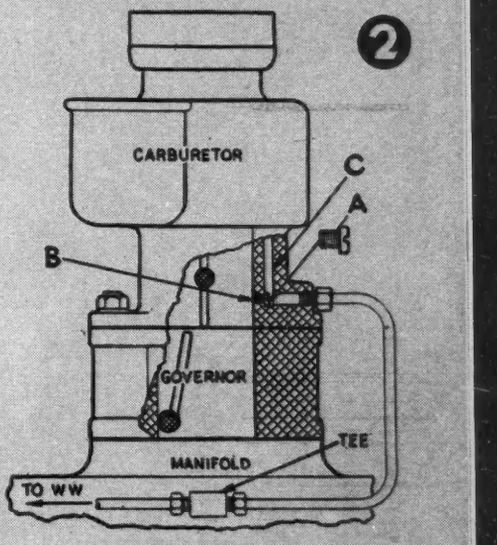


Fig. 3. With plug A, close channel B, leaving vacuum passage C open at flange face on Zenith 150 series.

Fig. 2. Insert screw A in channel B. Connect channel C to tee with external line. Insert tee in intake manifold. On Linkert R and DD, Marvel TUX-1, Stromberg SF 2-3-4-5, DX 2-3-4.

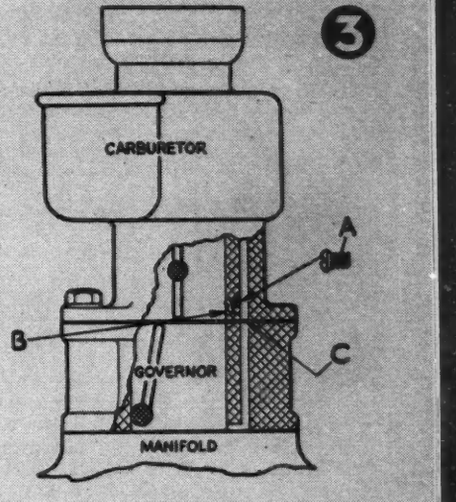
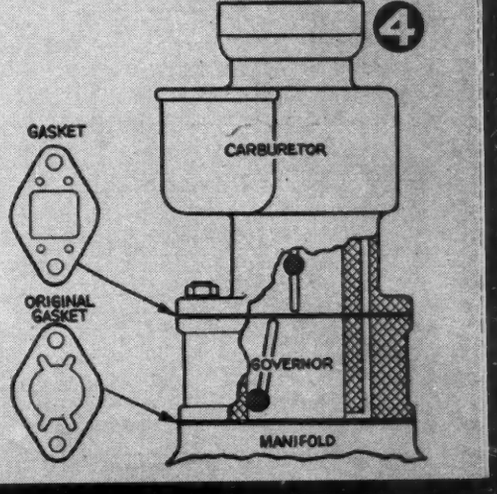


Fig. 4. Use special gasket between carburetor and governor on Ball and Ball, Chandler Groves and Carter 303S, 304S, 320S, 338S, 356S, 362S, 376S, 380S, 412S, 476S.



SERVICE stations that do truck repair work, either on the individual charge basis or on a flat rate plan of basic monthly charge plus parts, can profit from the installation of governors—and many do. First, there is the profit on the governor sale itself; second, customer satisfaction is increased as the result of lower operating cost and better safety records. The truck operator appreciates your interest in his problems—and every truck owner's problem is to operate his vehicle as economically as possible.

With controlled, but reasonable engine speeds, economies are effected in a great many ways. Excessive r.p.m. plays havoc, particularly in the lower gears; the truck deteriorates prematurely; operating cost goes up. A recent survey, among almost 200 truck fleets is said to have indicated savings as follows: Fuel savings, 13.5 per cent; oil savings, 26 per cent; tire savings, 22.6 per cent; brake savings, 29.2 per cent; insurance savings, 16 per cent; engine repair savings, 32 per cent; accident savings, 37 per cent; general maintenance savings, 26 per cent. If governors can provide such economies for the larger fleet operators, it is reasonable to assume that governors will do the same for the operator of one, two or five trucks—in fact, these savings are even more important to the small operator, with his more limited resources.

The installation of governors is extremely simple. Their application to any job is pre-engineered, that is, they are designed for each individual application—to take care of certain features or engine characteristics such as vacuum power jet control or automatic spark advance; they are packaged for a given job with all necessary fittings and illustrated instructions. At least one manufacturer provides governors that are pre-set to road speed, eliminating road-testing and governor re-adjustment. Such procedure is possible where axle ratio, tire size and governed speed are furnished so that actual road operating conditions can be duplicated on the dynamometer.

The proper installation of a governor is very important. Poor fuel economy and performance are sometimes attributed to the governor, but upon investigation it is found that neglect in correcting carburetors to accommodate governor installations is a contributing factor—some small detail overlooked prevents the governor from giving the performance and normal

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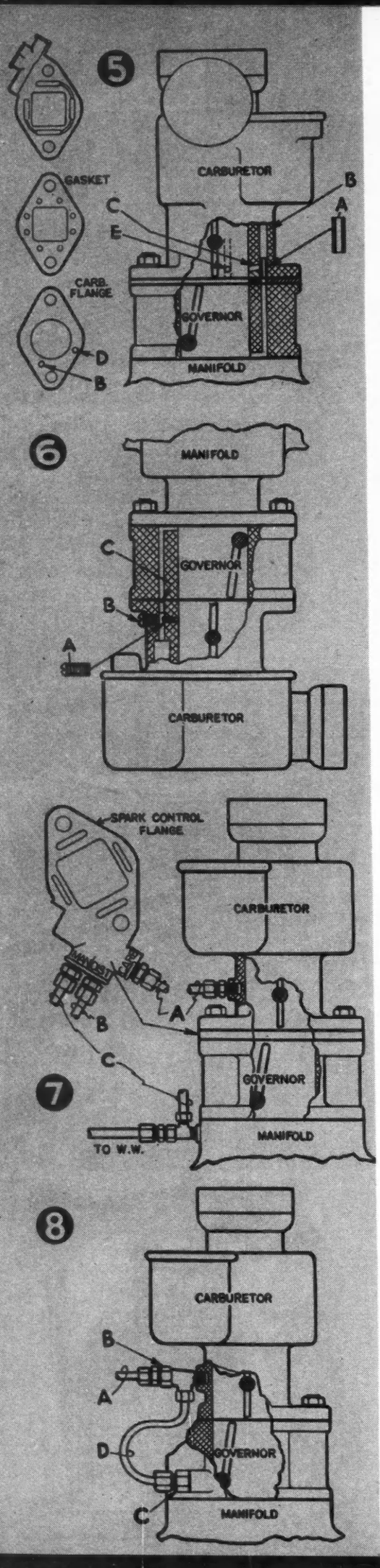


Fig. 5. On Carter 364S taxicab model, press tube A in channels B and E, closing openings C and E.

Fig. 6. On Marvel TUX; Zenith 116½ and Carter B&B CTA, CTA4, CTC1, CTB, CTB4, CTD1, ETB, ETB4, ETD1, remove plug B and plug A and close opening to throttle barrel. Special gaskets permit vacuum to by-pass through governor to carburetor.

Fig. 7. When carburetor has vacuum take-off for spark advance, a special device may be inserted between carburetor and governor as shown, transfer valve being in the special flange.

Fig. 8. When carburetor has vacuum take-off for spark advance and transfer valve is in governor, connect as indicated.

(Continued from preceding page)

fuel savings it should. These changes are quickly and easily made —nothing complicated. In the following paragraphs, instructions are given covering necessary changes on various makes and models of carburetors, to assure normal function of vacuum controlled power jet and automatic spark advance, when governors are installed.

Vacuum By-Pass

The modern carburetor requires certain corrections when the vehicle is shipped from the factory without a governor. This correction may be a hollow screw, a headless set screw or some other minor change to properly transfer vacuum from below the governor valve to the carburetor. It is vitally important that such changes be made, if proper carburetion is to be obtained and fuel savings accomplished.

There are many instances where the mechanic, on making a governor installation, has had no knowledge of these changes, due to lack of information from the truck or car factory, as to proper procedure in changing over carburetor for governor installation, or—because he has not had the necessary parts.

A common error is the transfer of governors from old to new equipment, where the old vehicles and governors had no provision for vacuum by-pass to carburetors. Under such circumstances a great deal of fuel is wasted because when the governor valve comes into play, the vacuum exists below the governor valve and cannot be by-passed through to the carburetor, with the result that the power jet is wide open whenever the governor valve is in control. This can be corrected only by by-passing this vacuum below the governor valve. Where provision has not been made in the governor for vacuum by-pass, the governor should be replaced with one in which this feature has been incorporated or the governor body should be drilled—and proper gasket used to by-pass the vacuum. (See Figs. A, B, C, D, E, F.)

Chevrolet and Ford

Special economizer units have been developed by one governor manufacturer for use on Carter and Stromberg carburetors as applied to Chevrolet and Ford engines, respectively. These economizer units automatically control the Carter metering pin and the Ford power jet by means of engine vacuum and improved economy is claimed.

Vacuum Spark Advance

A very important part of a governor installation is the proper hookup of the vacuum spark advance. Fuel economy and proper engine performance can only be accomplished when the vacuum spark advance device or control provides the same operation as though no governor were installed.

There are two methods of transfer: With transfer valve in a separate spark control flange (Fig. G), or, with transfer valve in governor (Fig. H). The advantages of the spark control flange are: It is a separate unit entirely, having no connection whatsoever with the governor installation—and—it can be used with any make of governor thus taking care of these conditions where the governor does not have this provision or where even though provision has been made, it fails to control the automatic spark advance—holding the spark on retard.

Once installed, velocity on vacuum flow governors require little or no attention or service. The governor will generally outlast the life of the vehicle. By following the above suggestions, properly checking the carburetor and automatic spark advance, when installing a governor you can reduce fuel costs materially for the truck owners you serve—save them money in a dozen ways.

MOTOR AGE SHOP OF THE MONTH

From a tiny shop started in 1928 the four Gray brothers have built what is said to be the finest equipped independent repair shop in the intermountain west. It is located at 404 North Second West St., Salt Lake City, Utah. Gray Motor Service, Inc., has eight mechanics and 20 other employes. Equipment investment represents more than $25,000 and more than 1000 shop orders are handled each month. Average yearly gross income is $77,000. The brothers work in shifts so that at all times one of them is on hand to greet customers. Regular subscribers to Motor Age, the five owners of the shop are shown above hovering over a recent issue. Standing are Clarence and Elmer Gray. Seated are Roy Crane, a new member of the firm, Walter and Bill Gray.

THE READERS' CLEARING HOUSE of Service Men's Queries

TRANSMISSION

I have a 1936 Chevrolet standard coupe that slips out of second gear going downhill or over rough roads. Another shop cut deeper notches into the shifting fork shaft to hold it in gear.

This caused hard shifting and apparently a strain on the main drive gear bearing, as it broke its retaining snap ring and the aluminum retainer that holds drive gear to transmission case.

Upon rebuilding it, I checked every part carefully and discovered the cluster shaft and cluster gears slightly worn, so I replaced them; also installed new main drive bearing, a new splineshaft pilot bearing, new snap retainer ring, and drive gear retainer; also new shifting fork shaft.

This car now shifts easily, but on rough roads going downhill in second it still slips out.

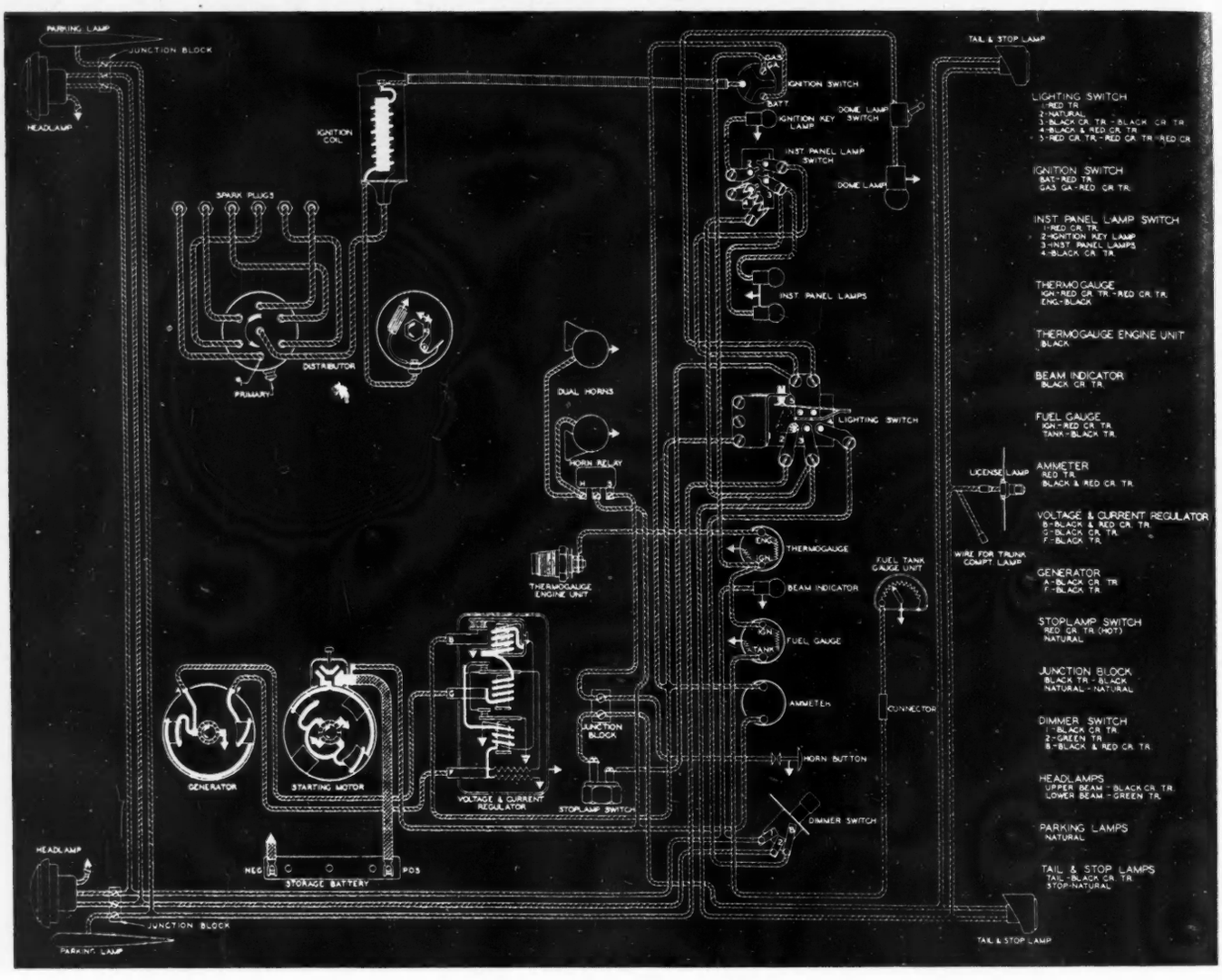
Could this be misalignment of the transmission, if so, where and how would I go about checking up on it?

Willow Creek Garage, W. B. Gaby, Willow Creek, California.

NORMALLY this condition is caused by poorly fitted gears rather than misalignment of the transmission. The usual correction is to select a set of gears that will fit with a minimum amount of backlash between the teeth. If there is an excessive amount of wear in the transmission case, where the cluster gear shaft fits, it will allow a slight movement of this assembly, which will have a tendency to make the second speed gear slip out of mesh. I realize that it is difficult and sometimes impossible to make a selection of gears that will be satisfactory, owing to the fact that you do not have several gears available from which to make a selection.

It is very difficult to check the align-

(*Continued on next page*)



1940 Pontiac Wiring Diagram—6 Cylinder

(*Continued from preceding page*)
ment of the transmission with the clutch housing, and it is sometimes quicker to do a little experimenting in an effort to correct this condition rather than to do a lot of checking to find out if the misalignment condition actually exists. The usual way of doing this is to take the paper gasket which goes between the transmission and the clutch housing, tear it in half horizontally and install only the lower half. This has a tendency to raise the rear end of the transmission slightly and sometimes will correct the misalignment condition without further work. Occasionally, the upper half gasket is needed instead of the lower half, although the lower half installation will correct the trouble more often than the upper half. It is a matter of experiment, however, and if I were you I would install the lower half of the gasket first. You may even find that this case might require the lower half of two gaskets instead of just one before you are able to correct the trouble.

Getting back to the transmission gears, you should check pretty carefully to be sure that there is no end play in the cluster gear assembly or in the transmission spline shaft, as this condition will also cause jumping out of gear.

Burns Coils

I seem to be into some trouble, and maybe you can help me. I have a 1935 Ford V-8 that seems to burn out a coil about every 5 or 6 weeks. Three of the coils melted the wax and it ran out; two did not melt it. I put on a rebuilt distributor and have looked over all the wires. The condenser seems to stay O. K. Have never burned out any lights. The generator charges 15 amp. at the best. The battery seems to stay up O. K. when it is used mostly on short drives not over 50 miles at a time. The car starts O. K. until the coil is about done for, then it gets so that he has to push it sometimes, and about three pushes and then a coil.

Will you please write me at once and tell me what you think is doing it? Viersen's Garage, Maywood, Nebraska, Box 204.

JUDGING from your description, there is every indication that this owner is not turning off the ignition switch when he stops the car, or if he does turn it off, he accidentally bumps it, in getting out of the car, turning it on again. It is also possible that if this car is being left in a storage garage where it receives constant cleaning service, one of the attendants is accidentally turning the switch on when he cleans out the inside of the car.

It would be well for you to check the two wires coming down to the ignition switch and also to check the ignition switch itself to be sure that it is cutting off when the switch is turned to the off position. The two wires mentioned are pretty close together and if they can be made to touch by jarring the car such as would happen when the owner left the car and slammed the door the result would be as you described in your letter.

I would not be inclined to blame the coils since you have tried different makes of coils and several of them in addition to using a rebuilt distributor.

Breaks Valve Springs

I have a 1936 V-8 panel truck. We are having trouble with breaking valve springs. We ground the valves, checked the valve guides, which were O. K., and put all new valve springs in. About two months after, the owner came back and had four springs broken.

I would like to know if you have any suggestion to make that will help us overcome this. I am a subscriber of Motor Age, *and surely enjoy reading it. Holman's Garage, 425 Popular St., Fostoria, Ohio.*

IT is my belief that the cause of the valve spring breakage you are experiencing in the 1936 Ford, will be found in a gasket leak, which permits water to get into the engine crankcase.

When this condition exists, it results in a corrosive action on the springs causing early failure.

I would suggest that you remove the cylinder heads, and install new gaskets, taking care to use a good grade of gasket cement designed especially for use on cylinder heads.

This condition is often aggravated by trucks and cars which make short trips only. Such service results in a lot of moisture condensing in the crankcase, and this moisture again corrodes the valve springs, causing breakage. When cars are driven for longer periods, the heat evaporates this condensation and consequently no trouble is experienced from corrosion. If the truck is being used in such service, I would suggest that you install thermostats which open at 180 deg. In addition, it is advisable to change oil under such conditions at about 500-mile intervals.

Static

I am writing you regarding a '39 Chevy coupe. The car is full of static electricity. When filling the car with gas, sparks jump across the hose nozzle. Is it possible that static could be generated in the car, and what could be the cause? Other cars that are filled at the same station at the same time do not have this static, so it cannot be caused from the location. This car has had this static ever since it was new. Have you known of any other cars charged with static and do you know what can be done about it?

The customer (owner of car) is afraid of an explosion every time he fills the car with gas. Ray C. Sutton, 1959 6th Street, La Verne, Calif.

THE static condition you describe is not at all unusual in many of the modern cars. In general, it is attributed to the friction generated by the air passing over the body of the car. This is aggravated in many instances by dragging brakes.

There is no sure cure for this condition, save to fasten a chain somewhere to the chassis and have the other end of the chain dragging on the ground. This is a stunt used by gasoline tank trucks, but unfortunately most car owners find a dragging chain objectionable.

I would suggest that first of all, you carefully adjust the brakes, making sure that they are not dragging. In addition, install static eliminators in the hub caps. These static eliminators can be purchased from most jobbers or from some of the local car dealers. Their purpose is to provide an electrical connection between the wheel spindle and the hub of the wheel.

In addition, take the tires off the wheels and then smear the inside of each casing with powdered graphite. The powdered graphite is to reduce friction between the tube and the casing, and also to provide an electrical path so that the current can more easily reach the ground.

The upholstery used in the interior on some cars will also tend to produce static charges. This is due to the friction of the clothing of the car occupants with the upholstery. Installation of seat covers will, of course, eliminate such a condition.

BILL TOBOLDT, Editor of *Motor Age*, conducts the Readers' Clearing House. Why not let him help you when you run across a job that's tough to "lick"? Just mail a card or letter outlining the difficulty. Help is yours for the asking.

Floods

In the garage where I am employed, we have six new TK-60 Dodge trucks equipped with Carter updraft carburetors as standard, and would like to know why and how to remedy these carburetors from flooding and overflowing immediately after ignition switch is turned off.

We have checked and cleaned these carburetors and set the float level according to factory specifications and put in new gaskets, but still the same trouble persists, regardless of whether the motor is hot or cold. The same trouble prevails in two K-60-V Dodge trucks, one of which has just had the carburetor completely overhauled at the factory with all new parts.

I have been a very interested reader of your magazine and would appreciate any help you can give on this case.

Harley Dorman 1025 Washington Ave., Piqua, Ohio.

IF you are absolutely sure that the float needle valve and seat are in good condition on your Carter-equipped Dodge trucks, I would suggest that you check the fuel pumps to make sure that they are not developing excessive pressure. These pumps should develop approximately three pounds pressure, and if yours are developing more pressure than that, I would suggest that you have them rebuilt.

If the pressure persists after overhauling the fuel pumps you can install a pressure equalizer or air dome, between the pump and the carburetor. This will serve to smooth out the pulsations from the pump and provide a steady pressure on the needle valve, which will reduce its tendency to leak.

No Start

I wonder if you could help us to solve a problem that has us baffled. We have a 1932 Chevrolet that will not start with the starter as long as the coil is in contact with any metal part of the car. It will start with a push, or on the crank, but does not run well then. It starts and runs fine when the coil is insulated. We checked all wiring thoroughly, but could find nothing wrong. A new coil acted exactly as the old one. When the coil is held very near, or slightly against the firewall with the switch on, an arc is produced. At present the coil is screwed to the underside of the footboard.

Another local shop faced the same problem on a Packard 120, and resorted to insulation of the coil also. We would appreciate any information you could give us very much.

Rand's Garage, 75 Pearson Street, Portsmouth, N. H.

(Continued on next page)

(Continued from preceding page)

THIS is quite evidently a defective coil. If the coil is properly insulated it will not pass electricity from the coil to the ground. You have proved this to be a defective coil or one that is not properly insulated, because you have found that when attaching the coil to the floorboard the coil operates all right. In other words, you have provided additional insulation by removing the coil from any metal part which could supply a ground.

It seems rather strange that the new coil you mentioned should perform in the same manner, and it is certainly very unusual that you happened to get another defective coil, even though it was a new one. No doubt you can return the new coil and secure another one which, I believe, will operate all right.

Loses Water

We are having trouble with a 1936 Pontiac to keep sufficient water in the radiator for safe driving. At 50 miles per hour it throws all the water out. I have cleaned the radiator, put new tube in the block, removed the thermostat, but am not able to remedy the trouble.

Will you please advise me what to do. Lee Collins, Lee Collins Garage, Route 2 at Obetz, Grove City, Ohio.

I AM inclined to believe that your trouble is due to an improperly tightened cylinder head. This condition will cause a compression leak at the cylinder head gasket into the water passages and will force the water up into the top tank of the radiator and out the overflow pipe. Since you have cleaned the radiator, installed a new tube in the block and removed the thermostat, it seems to me that the next thing for you to do is to remove the head and check it on a surface plate for being warped and, if necessary, dress it off until you have a smooth surface. Then install a new cylinder head gasket, using special gasket cement and reinstall the head, tightening the studs with a tension wrench to be sure that the head is drawn down evenly. Then I would install a new thermostat to bring the engine equipment back to standard.

Stuck Valve

We have a 1939 Dodge which developed a low speed miss at about 4000 miles. The miss and jerk is encountered when the motor is accelerated from low speeds of about seven to ten miles per hour. The car has 8000 miles on it now.

I have replaced the ignition coil with a heavy duty type. The plugs are spaced to .025 in. I have removed the distributor, freed up the breaker plate bearing and replaced the points, aligned and adjusted to .020 in. and retimed the ignition to 4 deg. after T.C. with a neon light.

The auto-choke is properly adjusted and functions perfectly. The acceleration pump works perfectly and the linkage is all tight without any noticeable free play.

The trouble still exists and I have several customers that are Dodge owners and '39 Chrysler owners, that all have this condition existing in their cars.

What remedy could you prescribe to eliminate this condition? — Clarence Krejcie, Krejcie's Auto Service, 819 Commercial St., Manitowoc, Wis.

JUDGING from your description, this condition has every indication of a sticking valve. The ignition work you have performed should have eliminated any possibility of the trouble being in that system, and I do not believe it could be carburetor trouble since the condition is described as a miss rather than a dead spot. This condition could very well be a sticking valve due to gum accumulation on the valve stem causing it to stick in the valve stem guide.

My suggestion therefore, is that you pull the head and remove the valve. Clean the valve stem off good and run a standard size reamer down through the valve stem guides. If you find there is a gum deposit on the valve stem indicating that this was the source of trouble, I suggest that you counter-bore the valve stem guides before you reassemble the job. This will have a tendency to prevent a recurrence of this condition.

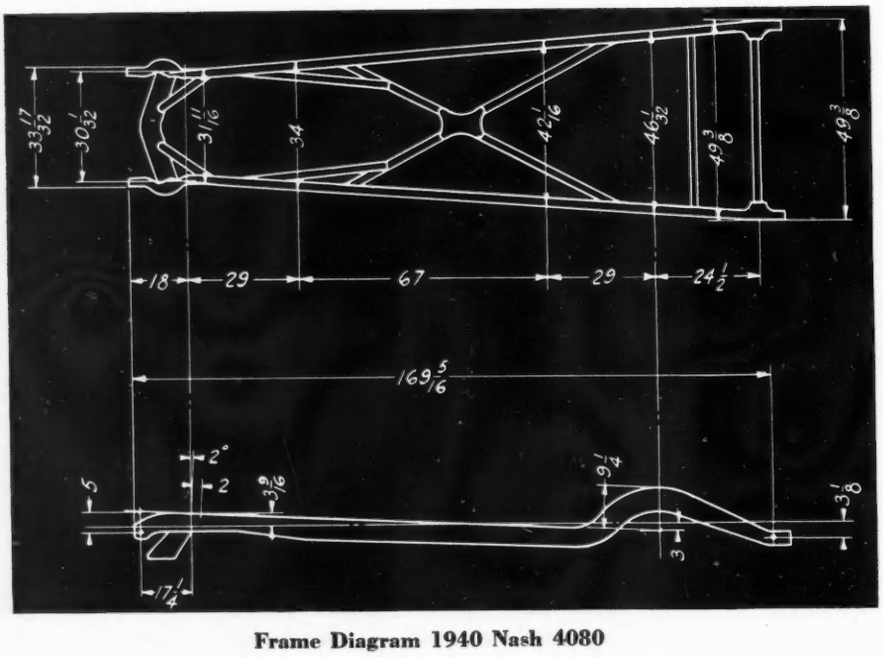
Broken Engine Support

I have a model AA 1½-ton Ford 1931 short wheelbase which has a vibration when coasting at about 40 miles per hour. This model has a low-speed rear end. I took out the rear end and everything is in perfect shape now. One axle key was renewed, the universal was perfect and I installed a new gear on the rear of the transmission and a new jack shaft. Now the shifting lever shakes and the vibration is still there. The gears behind the transmission were all worn out, the motor bolts were all loose, but before I had the vibration and a grind; now I have just the vibration, and when coasting to a stop, there is a grind which sounds up front and the shifting lever shakes, which it didn't do before I tightened the motor bolts; but it makes no difference, and the power in high is very bad. I enjoy MOTOR AGE, *but I never remember seeing anything like this trouble in it. Is it possible that the trouble could be in the transmission after taking out the badly worn gears on the jack shaft and installing new ones? The power was O.K. before.*

I would certainly appreciate hearing from you on this, as this is a wrecker and we hate to take it down unless we are pretty sure what the trouble is. Aaron Hammond, Hammond's Garage, Charlton Depot, Massachusetts.

THE first thing I would check on that Model AA Ford truck would be the engine front mountings and the front cross member. The springs in this mounting are quite possibly broken and in some cases, the cross member will be found to be broken, resulting in the trouble you describe.

I am not quite clear in regard to all the work you have done on the



Frame Diagram 1940 Nash 4080

transmission. If you have not replaced all the worn gears and bearings, these should certainly be replaced. In addition, I would make a careful check of the alignment of the transmission with the flywheel housing.

No Pedal

I have used Chilton every day for the last twelve years, but I cannot find this one in it anwhere—I cannot keep brakes on one 1936 Chevrolet Master, they go down overnight. Sometimes it is two weeks, and sometimes it is only one or two days. They are always full of air and also full of oil in the master cylinder when the car comes back.

I have relined the brakes on this car and overhauled the master cylinder three times, but cannot find where the air gets in. I have had a Stoplight switch on other cars do the same thing by getting hot when left on at night, but this will force the oil out the vent hole in the top of the master cylinder, and the switch seems to be all right on this car.

The brakes on this car have always done this, as the owner that had it sold it on account of this fault, and the owner now is going to get rid of it if I cannot make it brake as it ought to. I have had my garage thirteen years, and this is the first Chevrolet I ever had that I could not put brakes on that were O. K. Can you help me?

Rich's Garage, C. E. Richardson, 1019 Front Ave., N. W., Grand Rapids, Mich.

IT is quite obvious that this brake master cylinder is not right, otherwise you would not be having this trouble. Regardless of the fact that the master cylinder has been overhauled several times, it seems to me that the best thing to do is to install a new master cylinder in this car. Either the cylinder is scored or was not originally true, or there is some other condition that is responsible for allowing the air to get into the piston. Since overhauling the cylinder does not correct the trouble, the best thing to do is to install a new one. I would install the cylinder complete with new piston, new piston cup and a new check valve, in other words, a complete master cylinder assembly.

No Power

I am writing in hope that you will be kind enough to help me with some trouble on my 1929 Model A Ford. The car seems to have no power on climbing hills either from a running start or slowed down on a good-sized hill. I have to hit it up to 50 M.P.H. or more or it will keep slowing down; sometimes I have to put it in second gear. It just seems to die down as though there is no power in it.

I have new rings in it, new valve springs, new plugs and a special condenser such as is used on racing cars. The carburetor is a new Zenith Model B Ford type. The plugs are given .032-in. clearance, valves .012 to .013 in., and points .019 in. I had trouble with the car bucking between 15 and 23 M.P.H. I put a size 20 high-speed jet in, and it is O.K. now. I can idle down to five miles an hour in high and run it one or two blocks, step on the gas and it will take it nicely. When I start the car in the morning it seems to be lazy, as if the spark was late, and it has no power at all. I generally ride it in second gear for a couple of blocks slowly to warm it up right. As I ride it in second at 15 M.P.H., every once in a while the motor will grab hold and speed up just as if the spark advanced itself, then die down as though the spark were retarded. Maybe I will ride one block like that, then all of a sudden it will pick up again. I put in a new shaft that drives the oil pump and distributor, also the shaft in the distributor. I have fixed other Ford cars, and they all think that I am an expert on them, but I think I am no good—I seem to fix everybody's car, but mine burns me up.

New Brunswick, N. J., Subscriber.

AFTER having read your letter carefully, I am of the opinion that this trouble is caused by either one of two conditions, or possibly a combination of both of them. In the first place, I think you should clean out the gas tank, gas line and carburetor. Even though you have apparently overhauled the carburetor and installed a new jet, it is still possible that dirt is entering the carburetor from the gas tank and is causing this erratic action.

The other point is that this condition might be caused by a plugged muffler. It is my suggestion that you install a new muffler and at the same time examine the exhaust pipe and the muffler tail pipe to be sure that there are no dents or kinks in either of these pipes that could cause an obstruction to the free passage of the exhaust gas.

Flat Rate

Why don't you give Operation C1 on Oldsmobile 37-38-39? Sutton's Garage, 530 Court Street, San Bernardino, Calif.

OPERATION C-1 in the Manual is "Radiator Assembly R and R." This operation applies only to the old cars where the radiator and radiator shell formed a single assembly. On most of the modern cars, you do not have a radiator shell. Instead you have grille work and a radiator core. To remove the core, you would use operation C-2, and to remove the grille, you would use operation C-3.

Grease Leak

I am having trouble with a 1939 1½-ton Chevrolet truck leaking grease out of the transmission on the clutch facing. I have installed a number of clutch facings on account of grease on them. This grease comes out around main drive shaft that runs into clutch. Please advise how to remedy. Send diagram of transmission and assembly. Also have trouble keeping grease in the universal joints, which burn out very often.

Marrowbone Garage, Mr. C. B. Norris, Marrowbone, Ky.

YOUR letter does not indicate that you have had this transmission out in an effort to correct this condition. As you no doubt know, the transmission main drive gear has a retainer and gasket on the clutch housing side designed to permit grease from the main drive shaft bearing to drain back into the transmission. If

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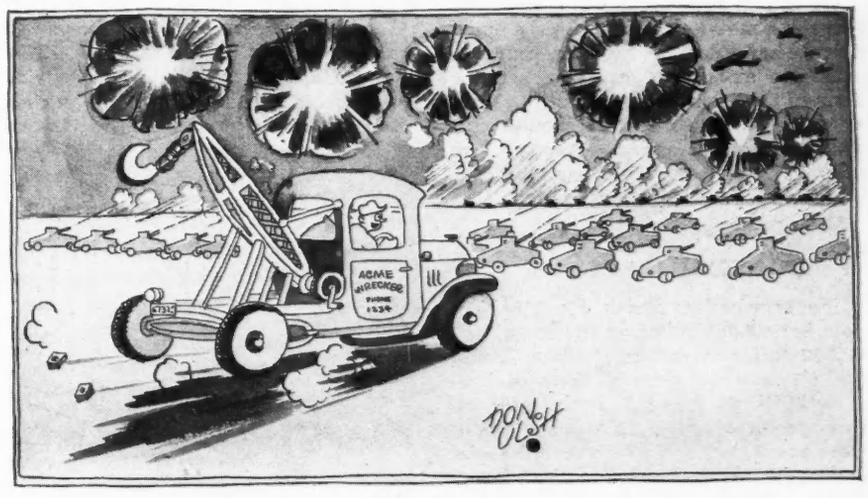
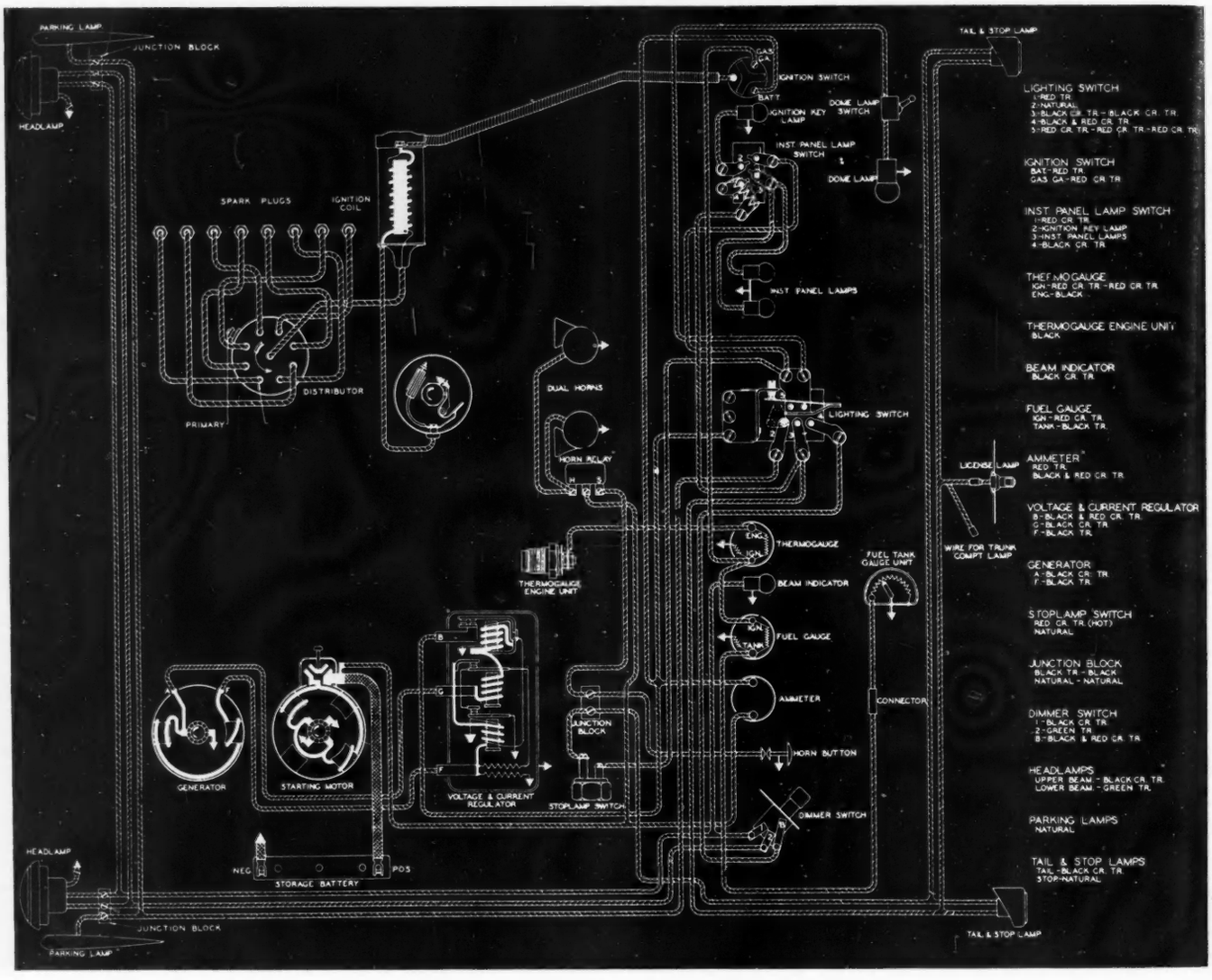


"Oh, Boy!"



1940 Pontiac Wiring Diagram—8 Cylinder

(Continued from preceding page)
this gasket has been incorrectly installed so that the grease return hole is covered by the gasket it will have a tendency to cause a leak. It seems to me that the first thing to do is to test this gasket and perhaps install a new one, being sure that the retainer cap screws are tight.

On the inside of the transmission there is a metal oil slinger on the main drive shaft designed to prevent an excessive amount of grease from entering the drive gear bearing. It might be well to install a new one of these oil slingers, although, of course, this means disassembling the transmission.

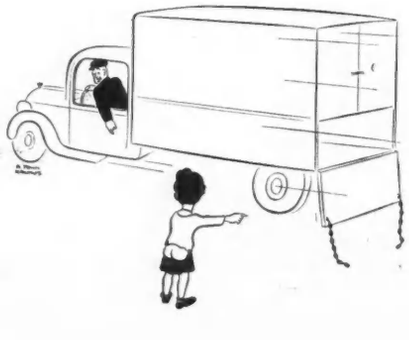
Worn Rods

We serviced a Buick 34-42 which now has 62,000 miles on it. At about 39,000 miles a rod cap screw broke and threw a rod through the side (no. 5 rod) We repaired it, practically no damage to shaft. At about 42,000 we put in balance of rods, old rods had spots checked out occasionally at joints, generally on sides of bearings where no actual pressure should come.

Now we have it down at 62,000 the front five rods are checked again as before.

Have been a reader of* Motor Age *or Chilton publications for 15 years. Without Chilton Flat Rate and other helps in it, we don't know if we could operate.

Seldom any job netting over $2 comes in our shop without consulting some Chilton publication for price, tappet, brake, point, timing, steering, carburetor or some other specifications too numerous to tabulate. N. M. Fawkes, Garage and Service Station, Bone Ga, Illinois.



THE condition you describe would seem to be the result of either an improperly fitted bearing or a bearing that has been fitted on a shaft that is slightly out of round. There are, of course, cases in which the connecting rod itself becomes sprung at the bearing end due to uneven tightening of the connecting rod cap bolts, and it is quite possible that this condition exists in this particular case. As a matter of fact, we understand that Buick made a change in the connecting rods for this car during the 1935 production, and our suggestion is that you obtain a set of the late type connecting rods and install them in this car.

Considering the fact that this job has been driven 62,000 miles, the first thing you should do is to check the rod bearing journals on the shaft to determine whether they are out of round. If they are, they should be turned down and a rod with an undersize bearing installed in order to get a proper fit.

New "Light" Program by United Motors

United Motors Service is announcing a program on headlight service for its distributors and dealers. With the motoring public made "light conscious" by the new Sealed Beam lighting on the 1940 cars, the service opportunities on automotive lighting have been substantially increased. To provide adequate service for this market United Motors announces a program for Guide Distributors which is designed to give a greater availability of Guide parts and service than heretofore. Under this new plan many service stations will be able to qualify for limited lamp service who in the past have been unable to take advantage of the big potential market for lamp service and the sale of auxiliary lamps.

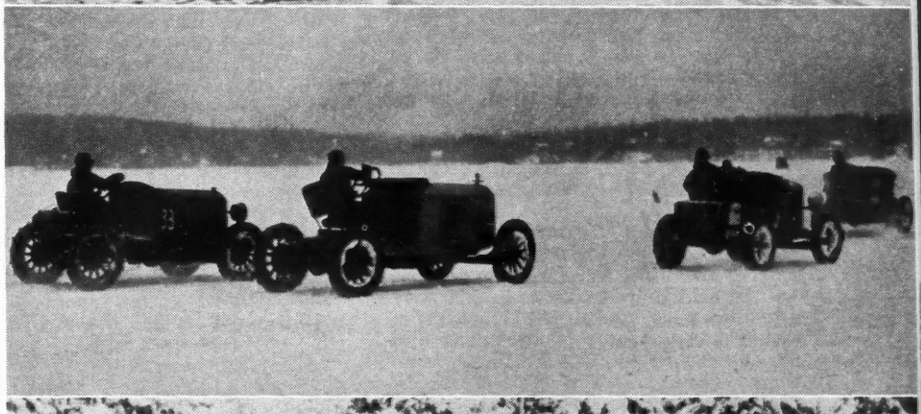
An interesting new item has been designed and will be offered for the first time with this program. It is the light Compar-o-meter which, it is said, enables any station to compare the light output of any car with present headlights using 1940 Sealed Beam Lighting.

A feature of this program will be two sound-slide pictures. These films present in a condensed, graphic manner information of an effective selling plan for distributor's salesmen and for station set up for Guide service. The entire program will be presented to United Motors branches by general office personnel, and immediately thereafter to dealers.

As Winter Fades

As the ice and snow rapidly disappear, praise Allah, and mechanics turn to spring tune-up business, we give you the last batch of winter pictures that will appear in these pages for a while. Top photo shows Kenneth Richards of Springfield, Mass., seated in his home-made ice boat which is said to be capable of 60 m.p.h. Weighing 300 lb., it is built of airplane tubing covered with fabric and skims over ice and snow on runners made of angle iron fastened to the fuselage by landing gear made of electrical conduit. It is powered by a motorcycle engine.

In the next photo Peter Robinson and Carl Grae of Long Island, N. Y., are shown in their powered ice boats on Lake Ronkonkoma, L. I., as they were about to start a race. The craft on the left is a four-cylinder job, the other a two-cylinder. One scooter was clocked at 85 m.p.h. on this lake.



Jallopies also find their way to the ice covered lakes as is indicated in the photo second from bottom. On Contoocook Lake at East Jaffrey, N. H., drivers gather each Sunday during cold spells. On the mile track laid out on the ice speed averages 70 m.p.h.

The pioneering spirit hasn't left the West. When the state highway department failed to clear snow from a 20-mile stretch near Jackson, Wyoming, citizens appropriated one of the state's rotary plows (bottom photo) to do their own clearing.

ONE HORSEPOWER BETTER THAN SIXTY

This four cylinder horse and buggy and others like it are becoming familiar sights on the streets of Stockholm. Gasoline rationing has seriously hampered delivery vehicles, so a laundry company has acquired horses to pull each of its light trucks.

AAA Releases Early Race Schedule

May List Stock Car Classics at Langhorne

The racing schedule of the American Automobile Association will get a late start next month, according to the pre-season list of events at Contest Board offices in Washington, D. C.

The opening event—five days later than the 1939 inaugural—will take place at the fast Reading, Pa., fairgrounds on April 21. Last year, Reading lost its place as the Eastern season's opening site when Mark Light, driver-promoter, obtained a sanction for an event at Lebanon, Pa., on April 16.

The Reading opener will be in addition to the sprint races held during the fair in September. For some years now Reading has presented an early-season race program followed by the annual speed events during the county fair.

The Langhorne Speedway—fastest of the mile tracks—near Philadelphia, Pa., also will open its schedule later than it did in 1939. The first of two events listed for Langhorne this season will be held May 19. The second will be run June 16. Whether others will be held there in 1940 has not been announced by Ralph A. Hankinson, owner and operator of the track and the oldest promoter of AAA sanctioned racing in the United States. Langhorne's 1939 card opened on May 14. In addition to the May and June races at Langhorne last year, a stock car classic was held July 4.

Hankinson has not yet completed plans for a schedule of five All American stock car races he said he would operate in 1940 at Langhorne and other major tracks throughout the United States. If plans materialize, Hankinson says the 200-mile classics will be open to the everyday motorists. The rules will be similar to those in effect at Langhorne's stock car event last year.

The schedule of National Champion races, which allow points toward the United States speed crown, remains virtually the same as it was in 1939. Again the title events will be run at the Indianapolis Speedway on May 30; at the Wisconsin State Fair in Milwaukee on August 25, and at the New York State Fair in Syracuse. As was the case last year, the International Sweepstakes at Indianapolis will be 500 miles and the Milwaukee and Syracuse classics will each be 100 miles.

Wilbur Shaw, who won last year's Indianapolis "500", is the current national champion and will reign until the close of the 1940 campaign. Shaw will receive his national championship medal from the AAA Contest Board at Indianapolis the day before the International Sweepstakes is run.

The pre-season schedule allots dates to Williams Grove Speedway, near Harrisburg, Pa.; and Altoona (Pa.) Speedway in addition to those mentioned.

The early schedule released by the AAA is far from complete. It lists only 22 events, although Ted Allen, Contest Board secretary, says the 1940 card of events should surpass activities of 1939. Last year more than 50 races were run.

Although the schedule for the county, state and district fairs has been announced in its entirety, the speed fraternity expects to again open the Fair season at the Delaware State Fair in Harrington. Last year the Harrington races were held on July 29, and for some years now the Fair season has opened at Harrington.

Following is the schedule the AAA has approved to date, with additions certain to follow:

April 21	Reading, Pa.	Sprints
May 5	Williams Grove, Pa.	Sprints
May 19	Langhorne, Pa.	Sprints
May 26	Williams Grove, Pa.	Sprints
May 30	Altoona, Pa.	Sprints
May 30	Altamont, N. Y.	Sprints
May 30*	INDIANAPOLIS, IND.	500 Miles
June 9	Milwaukee, Wis.	Sprints
June 9	Williams Grove, Pa.	Sprints
June 16	Langhorne, Pa.	Sprints
July 4	Williams Grove, Pa.	Sprints
July 14	Milwaukee, Wis.	Sprints
July 21	Williams Grove, Pa.	Sprints
Aug. 18	Milwaukee, Wis.	Sprints
Aug. 18	Williams Grove, Pa.	Sprints
Aug. 22	Milwaukee, Wis.	Sprints
Aug. 25*	MILWAUKEE, WIS.	100 Miles
Sept. 1	Williams Grove, Pa.	Sprints
Sept. 7*	SYRACUSE, N. Y.	100 Miles
Sept. 22	Williams Grove, Pa.	Sprints
Oct. 6	Williams Grove, Pa.	Sprints

* National Championship classics: The date for the New York State Fair race is tentative, but the event is definitely scheduled.

Hein-Werner Reports Business at Peak

The year 1939 was the biggest in the history of Hein-Werner Motor Parts Corp. at Waukesha, Wis. Sales were up one-third over 1938, even though 1938 sales were also over 40 per cent ahead of 1937. Hundreds of thousands of Hein-Werner hydraulic jacks were sold in 1939 and the addition of three new models to the line is expected to increase 1940 sales by at least 33 per cent, the company states.

Nearly 600 new jobbers added the Hein-Werner line during 1939, which gives the company a total of over 2500 jobbers throughout the country. They have all started the year 1940 by giving the factory the biggest January and February in history; an increase of over 30 per cent over the same period last year and double that of 1938. Increased production has made it necessary that a large addition be built to the Hein-Werner factory which already covered approximately one full block.

New York Maintenance Show to Be Biennial

According to announcement just released by Walter V. Hall, secretary of Automotive Industries Association, the board of directors agree with the industry's current thinking that regional trade shows held biennially are more advantageous than annual exhibits. The Metropolitan Automotive Maintenance Show Committee have decided to hold the next maintenance exposition in the spring of 1941.

The committee voted to skip 1940 partly to give immediate effect to the biennial idea since an exhibit was held in 1939, and partly because of war conditions. Up until last year the show had been held annually for three consecutive years. It, therefore, had become well established and had drawn a large attendance not only of dealers, service managers and repair shop operators from the metropolitan and nearby New York, New Jersey and Connecticut areas, but also major oil company executives, exporters and wholesalers with their sales organizations from a 200-mile radius who held product-demonstration conferences with representatives of exhibiting manufacturers of accessories, replacement parts, shop equipment and tools.

Blackhawk Offers Trade-in Deal

A nation-wide "tool up" campaign is being built by jobbers around a spectacular trade-in deal instituted by Blackhawk Mfg. Co. Mechanics now have the opportunity to bring their wrench equipment up to date without sacrificing their entire investment in present tools.

Remarkable progress has been made in the design of modern wrenches and portable stands during the past few years. But business circumstances and the eternal question, "What will I do with my old tools?" have stymied mechanics from enjoying these developments.

Hub of the mechanic's tool-up campaign is the Blackhawk Wrench Trade-in deal, effective in the United States and Canada. The mechanic receives $25 credit on 40 old wrenches toward the purchase of a special 100DD assortment containing 87 modern Nugget socket wrenches, box-types and open-ends in a portable wrench bench. These 87 Blackhawk wrenches actually offer the coverage of over 110 ordinary tools, because of Nuggets, the company states. A $5 allowance on a similar quantity of old tools is credited if the mechanic buys the special 35B set. The 35B includes a modern case and 34 Nugget wrenches.

In addition to the trade-in, Blackhawk contends that the mechanic makes a tremendous saving in his investment because 7/16-in. drive Nugget wrenches in the 100DD and 35B eliminate the costly duplication between ⅜ in. and ½-in. square drive series. Blackhawk states that mechanics and engineers, in a two-year survey, have found a single job, ordinarily handled by ⅜ in. or ½-in. drive wrenches, that cannot be best served by the 7/16-in. drive Nuggets.

The 100DD set contains the very latest Blackhawk wrench developments, including a new non-slipping, two-length ratchet, ¼-in. drive "Nuggies" socket and handles, and Hexite open-ends and box types. A set of ¾-in. drive heavy-duty wrenches is also in the 100DD, in addition to tappets and Nugget socket wrenches. The trade-in deal, which started March 1, closes June 30, 1940.

Bendix Twinplex Hydraulic Brake

The new Bendix Twinplex Hydraulic Brake is described as combining outstanding smoothness and effectiveness of brake performance with extreme simplicity of mechanical construction, and correspondingly simplifying service requirements.

Two hydraulic cylinders are used in each brake, and the brake shoes are actuated directly from the piston caps without using anchor pins. Both shoes are equally effective and have the same "self-energizing" action whether for forward or reverse travel of the vehicle. Since each shoe is doing an equal share of work, lining wear is the same on each shoe, and it would be expected that a given set of linings would run farther without need of replacement.

Other advantages claimed for this direct action are: no wearing points to develop looseness or alter the leverage, friction in working parts reduced to a minimum, with no chance for rust or poor lubrication to cause excessive friction—in fact, no lubrication is required. Obviously, the reduced friction of internal working parts reflects on low pedal pressures.

The two brake shoes are duplicates of each other, and therefore are interchangeable end for end, top for bottom and right for left. Likewise, the cylinder assemblies are interchangeable—forward for rear, and right for left. Obviously, these features of simplicity and interchangeability greatly reduce the number of parts that have to be carried in stock.

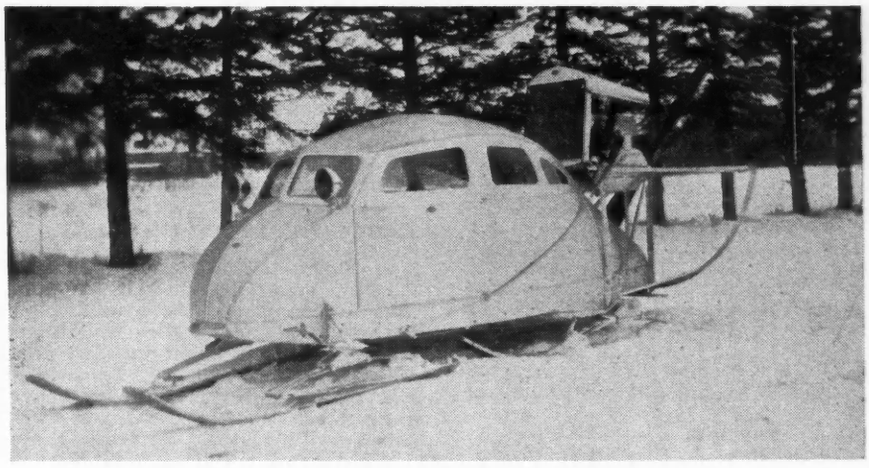
From the standpoint of adjustments, the procedure on the Twinplex Brake is extremely simple. No dummy drums or other adjustment fixtures are required. There are no anchor pins or eccentrics. To adjust the brake, it is merely necessary to turn each adjusting screw until the shoes come firmly against the brake drums; then back off each adjusting screw six notches for clearance. The possibility of incorrect adjustment in the usual sense is eliminated, since if the clearance is excessive, it does not affect the functioning of the brake, but simply results in reduced pedal reserve. Note that special tools for adjustment are not required—not even a feeler gage.

The usual rubber boot for protecting the end of the hydraulic cylinder from dirt has been replaced by a telescoping metal sleeve.

An interesting detail of the Twinplex design insures against misalignment or "cocking" of the brake shoes. The retaining pin and spring hold the shoe firmly against a "ledge" on the backing plate. Movement of the shoe away from the backing plate is limited by the construction of the spring retaining caps.

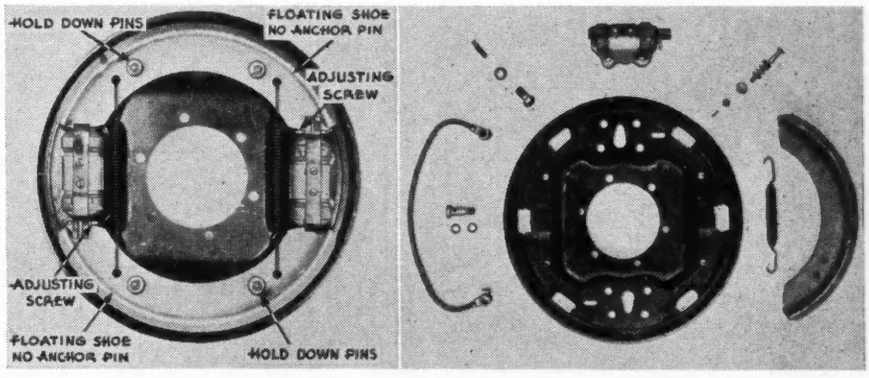
The cylinder design is carefully worked out so that the cylinder wall is not exposed at any time, thereby reducing the possibility of grit or foreign matter finding its way past the boot and eventually causing the piston to stick or the cylinder to score.

Recognizing that a certain amount of brake drum distortion is unavoidable, the Twinplex is designed to reduce the possibility of this distortion causing the shoes to lock or to affect the self-actuating characteristic of the brake. Incidental to this feature is the fact that a wider range of linings can be used without affecting good brake control and all-around performance.



SNOW TRAVEL DELUXE

This luxury model snow-sedan, made by R. J. Fudge, Moosomin, Saskatchewan, has seating capacity for four people and is capable of speeds up to 50 m.p.h. It steers like an automobile, has a foot and hand accelerator, and brakes which consist of foot operated steel prongs which dig ino the snow. The runners are made of hickory, shod with steel.

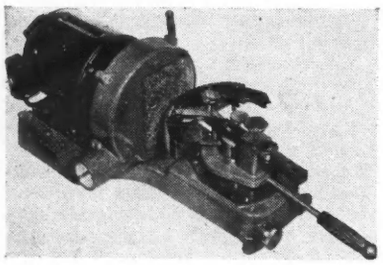


Only the items shown above at right need be carried in stock for servicing the Bendix brake.

Competing with over 400 Prest-O-Lite distributors, Perfection Storage Battery Co., Brooklyn, N. Y., won the Silver Anniversary Sales Trophy presented by Collier's Magazine in behalf of the Prest-O-Lite Co. Perfection's president, A. Bierderman, on right, received the trophy from H. E. Komitch, Prest-O-Lite vice-president.

Brake Shoe Grinder

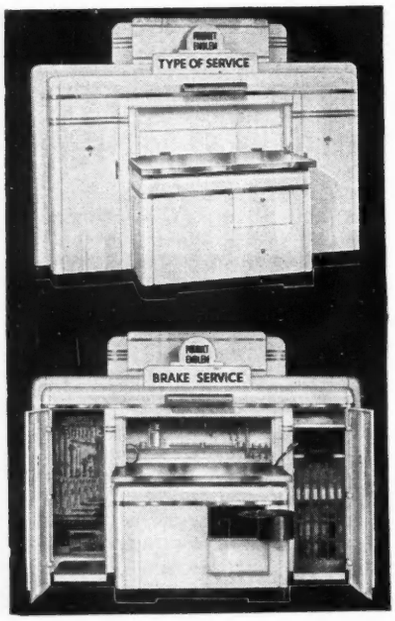
A brake shoe grinder that can be set up for any type brake shoe from 9 in. to 18 in. has been announced by Lempco Products Co., Bedford, Ohio. Only two different set-ups are required, one for T-rail shoes and one for cast shoes. Grinding different sized shoes is provided for by a staggered series of holes drilled in the base plate of the grinder. These holes are marked off in inches to correspond to the various drum diameters. The turret, or brake shoe holder, is placed



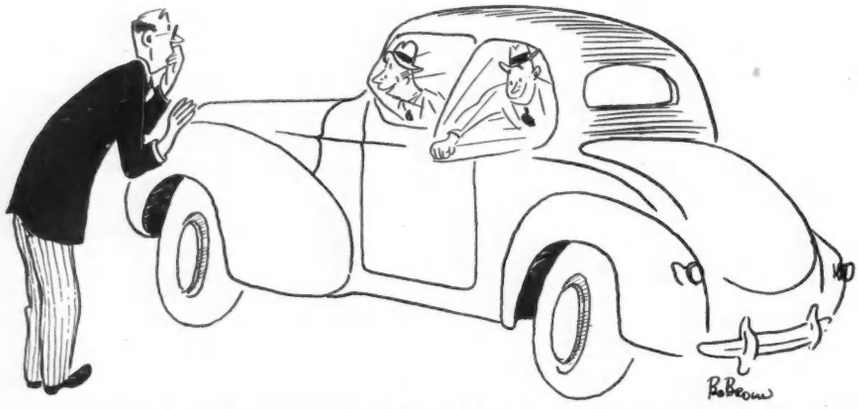
in the particular hole corresponding to the brake drum diameter which the shoes must fit. Fractional sizes are obtained by adjusting a micrometer dial on the end of the machine. A twist of the knob clamps the shoe in place. To bevel the ends of the lining requires pulling a lever which slides the motor back and forth and grinds the ends of the lining to any depth desired.

Lincoln Merchandisers

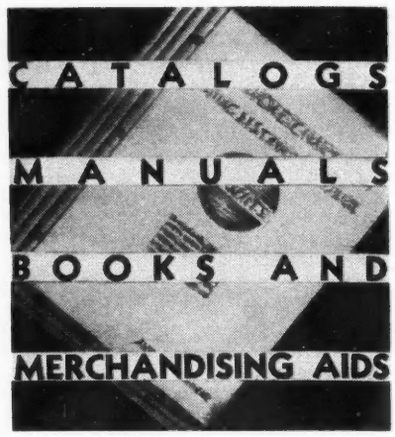
A combination of utility and showmanship is attained in the new Lincoln Merchandisers now available for departmentalizing service operations by the Lincoln Engineering Co., 5701 Natural Bridge Ave., St. Louis, Mo. The merchandiser is made of heavy gage steel with a steel built-in work bench in the center. On the left is a tool cabinet and on the right a compartment for coveralls, wiping rags,



creeper and car standards. There is a Lincoln Merchandiser for lubrication service, for brake service, for carburetor and fuel pump service, for engine service, valves, transmissions, rear axles, steering work, shock absorbers, headlight service, and many others. They are finished in baked white enamel trimmed in stainless steel. The base is glossy black, and the top of the work bench is finished in red.



"Gentlemen, please don't overdo our new Plexiglass!"



The Black & Decker Mfg. Co., Towson, Md., has recently issued its 1940 catalog which covers its complete line of portable electric tools. Emphasis has been placed on the redesigned and improved ¼-in. Junior drill and the ½-in. Junior drill, along with several other tools introduced for the first time.

A new catalog describing its complete line of latest model air compressors in sizes from ¼ to 15 hp. developed especially for garages, service stations and spray painting has been issued by the Worthington Pump & Machinery Corp., Harrison, N. J.

The new Brake Service Guide, published by The Raybestos Division of Raybestos-Manhattan, Inc., Bridgeport, Conn., is now available for distribution through Raybestos dealers. This second edition of the Brake Service Guide contains diagrams of brakes used on the 1940 models, as well as handy trouble shooting charts and a quick reference index of makes and models.

A new 900-page manual of repair and tune-up operations on trucks, buses, tractors and Diesel engines as well as passenger cars from 1935 to 1940, has been prepared for the automotive maintenance trades by Thompson Products, Inc., Cleveland. The 1940 edition, which lists at $20.00, is offered free by Thompson Products distributors in return for an order for Thompson replacement parts. A 500-page book covering passenger cars only was similarly distributed by the company last year. Twelve thousand copies were taken out by repair shops, according to Tom O. Duggan, general manager of the Thompson Products service division. Four hundred pages of the manual are devoted to heavy-duty units, including Diesels.

The new manual includes complete tune-up instructions, bearing tolerances, oil pressure data, timing gear settings, valve and piston clearances, octane and automatic choke adjustments, magneto and carburetor information, clutch and transmission work, brake relining, spring suspension data, front and rear axle service, wheel aligning, wiring diagrams, injection timing (Diesels), ring clearances, ignition timing, gear lash, valve spring pressures, valve seat angles and widths, piston and rod removal and installation, pin fitting,

(Continued on page 42)

NOTICE
INDEPENDENT SERVICEMEN

Have You Received Your 1940 Chevrolet Parts and Service Information?

In order that you may be in a position to provide the very best possible service for the many Chevrolet owners who come to you for their work, Chevrolet dealers want you to have all the up-to-date information on the 1940 models, as well as complete parts and service data on previous model Chevrolets.

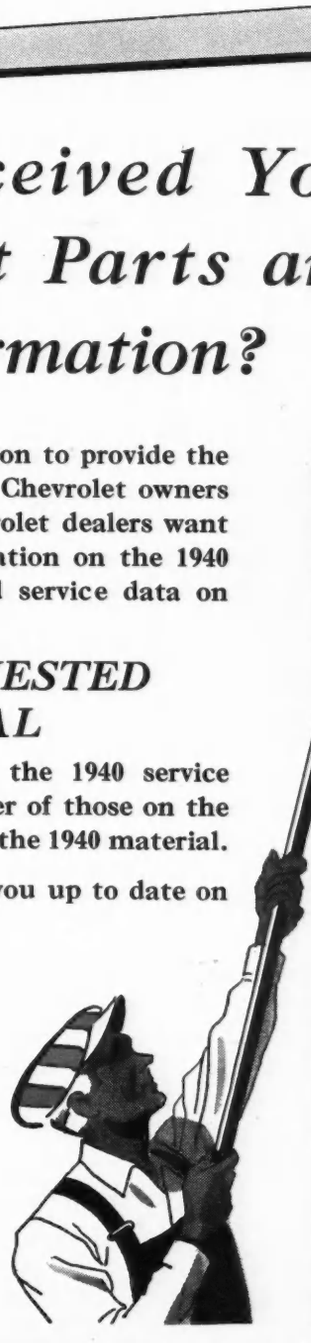
25,000 HAVE REQUESTED 1940 MATERIAL

Thousands have already requested the 1940 service helps, but there are still a large number of those on the 1939 mailing list who have not asked for the 1940 material.

You need these new books to keep you up to date on price changes of parts, new flat-rate schedules and 1940 service methods. Fill in the coupon; have your Chevrolet dealer sign it; mail it in—and they will be sent to you free of charge.

CHEVROLET DEALERS OF AMERICA

and **CHEVROLET MOTOR DIVISION**
OF GENERAL MOTORS SALES CORPORATION
DETROIT, MICHIGAN



COUPON

For 1940 Chevrolet Parts and Service Information

Please Ship to Me Free of Charge:

- ☐ **1940** CHEVROLET MASTER PARTS BOOK
- ☐ **1940** CHEVROLET TIME SCHEDULES
- ☐ **1940** CHEVROLET SHOP MANUAL
- ☐ **1940** CHEVROLET MONTHLY *SERVICE TOPICS*

NAME_____

GARAGE_____

STREET_____

CITY AND STATE_____

HAVE YOUR CHEVROLET DEALER SIGN HERE

Bring in the Gals

(*Continued from page* 22)

garage closer, but no one seems to know what kind of work that fellow down the street does so, rather than take a chance, back they go.

Take this friend of ours for example. Her car was purchased at a place near her husband's office. This happens to be ten miles from her suburban home, and most of the ten miles run through township centers—the kind of traffic that makes for miserable driving. In spite of all this that's where she heads when the car needs attention, and since she is then several miles from shops and friends the repair time hangs heavy on her hands.

Near her home there are at least half a dozen good garages that could do her work as well as anyone. Why doesn't she go to one of these? Simply because such a thought never entered her head. None of these places in their efforts to contact her have shown an understanding of her needs and problems, or convinced her that they're equipped to handle her business.

This isn't the garage man's fault. He wants and needs her business just as much as she wants and needs his services, but I'm afraid that in a majority of cases he misses the boat.

The question then is: How could he make an impression? One entrée might be through the youngsters. An oil company that offered balloons to the children of customers, found themselves so swamped with business that they had trouble keeping stocked with enough balloons. It needn't necessarily be balloons—there are lolypops, paper dolls, tops, kites, jacks—whatever appeals to the neighborhood youth. When the kid in the back seat says "Mom, buy your gas over there; I wanna balloon," Mom is pretty sure to comply. Once you have made the contact the rest is easier.

That's one means of entrée—through the children. A second might be handbills that are dropped into cars parked at the grocery, the bank, the Woman's Club, etc. These should appeal primarily and especially to women emphasizing, for instance, your care to see that all cars are clean when they leave your shop, your call and delivery service, your reasonable prices. Handbills may annoy men, but if they're properly distributed they get read by the women, and I'm sure that a woman who found a garage wanting especially to cater to her needs would at least give them a try the next time she needed service. (By the way, keep the message on these handbills *short* and *eye-catching*.)

A third method for which you are probably already paying is the hundred and one odd (or so it seems) advertisements you are asked to place in play and benefit programs. The next time that you are approached by the Whatnot Players replace the usual "Compliments Jack's Garage" with something that will make an impression.

If you're stuck for ads that appeal to the woman drop us a line care of the Chilton Company, 56th and Chestnut Streets in Philadelphia. Maybe we can be of help . . . at least we think so.

Department stores have found that it pays them to include in their monthly statements a little folder telling of items (some special, some not so special) which they feel will be of interest to their clientele. When you present a bill to a customer (either through the mail or directly) include a leaflet about some thing or some service which you render. Maybe one month it's a special on lubrication, another month it's waxing, or washing and polishing, another month it's seat covers. Maybe it's a special price, maybe it isn't, but at least it serves to remind her that "we really need seat covers! Ours are a *disgrace*."

Remember she needs your help as much as you need her business, so all either of you really need is to get together.

Tapscott Named Director of Highway Sign Association

Charles C. Tapscott, advertising manager of the McQuay-Norris Manufacturing Co., has been elected director of the American Highway Sign Association. Other automotive men who are directors of this Association are S. Messer of the Quaker State Oil Corp. and W. S. Zehrung of Pennzoil.

COLLIER'S RUNS CAMPAIGN!
DEALER SPENDS $6 ON TIE-INS!
DEALER MAKES SALES OF $214.71!

IT'S a typical example of the vitality of the slogan "Collier's for Action." When Collier's goes into action, it delivers more than "influence"—it delivers cash on the barrel head.

Like thousands of dealers all over the country, Mr. Charles Westgate, Shell Oil Dealer of Ardmore, Pa., knew that Collier's P. S. Campaign meant business. He bought $3 worth of P. S. reprints and spent $3 in postage to mail them out. RESULT: he got $121.16 of new business from old customers and $93.55 from 16 new customers. $214.71 from one little mailing! *Collier's for Action!*

Other dealers report customers coming in with Collier's P. S. spreads checked showing what they want done. . . One dealer reports 300% increase in jobs through P. S. mailings. . . Another reports a 28% increase in the average amount of the job ticket.

How to get your share. Identify your place of business as the place to get Preventive Service! Display Collier's P. S. reprints! Mail Collier's P. S. reprint folders to your customers and prospects! *That's how easy it is!*

"Preventive Service" is a continuous campaign, sponsored by COLLIER'S in the interest of 2¾ million Collier families—owners of more than a billion dollars' worth of motor cars.

TIE-IN MATERIAL NOW READY ON SPRING TUNE-UP SPREAD

"The Tune-Up that Comes in the Spring"—fourth installment in the P. S. Series appears in COLLIER'S March 30th issue (on newsstands March 22nd). Reprints, displays and mailings now available (at actual cost). For information and prices, ask your jobber or manufacturer or write PREVENTIVE SERVICE, COLLIER'S, 250 Park Avenue, New York City.

P.S. campaign

Bonneville Saltbed, in Utah—scene of the greatest land speeds man has ever experienced—will become a proving ground for American automobile manufacturers in 1940, racing experts predict. From official sources comes the word that several car manufacturers are considering plans to prove their cars on the unrestricted area of the salt flats, now that British competitors for the world straightway speed record will not come to the United States in 1940. Because of the secrecy maintained at all times in record runs of manufacturers, no builders contemplating tests have been revealed as yet at headquarters of the AAA Contest Board.

* * *

Despite war talk, American spirits continue to ride high, as evidenced in customer preference turning away from black colored cars. While black is tops, more buyers are turning to the variety of other colors offered by manufacturers. An analysis of Buick cars, covering 1940 models entered in production through Jan. 1, revealed the percentage in which customers desired colored cars, as follows: black—33.9; dark gray—9.7; two-tone green—8.8; dark green—8.7; maroon—8.5; light blue—7.6; two-tone blue and gray—5.8; light gray—5.7; dark blue—5.1; light green—2.8; brown—2.0, and cream—1.2. Special paint jobs produced for automobile show purposes accounted for 0.2 per cent.

* * *

Perfect Circle Co. elatedly reports that sales of its piston rings for replacement during 1939 were the greatest in the company's history. Employment in the three P. C. plants in this country is running at high levels and the company expects 1940 to set another new high.

* * *

Chevrolet produces a shining example to back up its "economy" claims. The car has seen more than

(Continued on page 64)

Merchandising Aids

(Continued from page 36)

sleeve removal and installation, rocker arm angles, oil pressure regulation, variations in stock truck engines, injector service procedure and timing for Diesel engines, etc., etc.

During the year shops that have the new manual will receive 18 supplements covering the latest passenger car and commercial models.

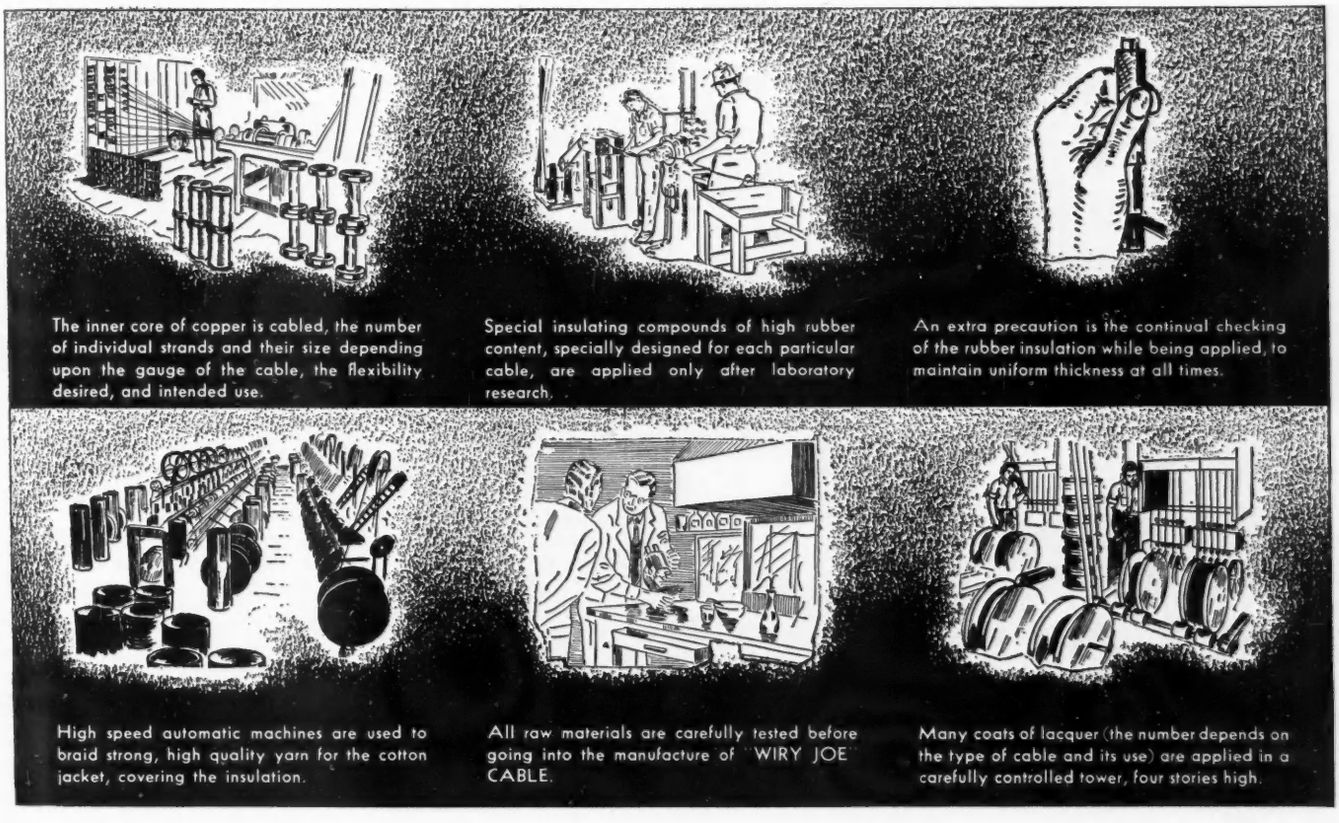
To make spark plug analysis a quick, easy and reliable procedure, the Spark Plug Division of Electric Auto-Lite is supplying its dealers with large color-matching charts of enameled metal. The charts indicate six plainly distinguisable colors, one of which will be similar to the color found on every used plug, regardless of make.

Matching the insulator color against the colors of the Auto-Lite Analysis chart the Auto-Lite spark plug dealer quickly determines whether the plug is of the correct type and is operating under favorable or unfavorable service conditions.

A valuable feature of the Auto-Lite spark plug color matching chart is the fact that it backs the spark plug dealer's judgment with scientific authority; the indications of the chart are so plain and unmistakable, the company reports, that their meaning is also quickly understood by service station customers, many of whom are unaware that the operating conditions of their automobile, truck, tractor or marine engines may be adversely affected by plugs chosen without proper regard to the conditions under which they must operate.

Higher Sales Totals Need Lower Prices

3 OUT OF 5 MOTORISTS NEVER BUY A NEW CAR



The inner core of copper is cabled, the number of individual strands and their size depending upon the gauge of the cable, the flexibility desired, and intended use.

Special insulating compounds of high rubber content, specially designed for each particular cable, are applied only after laboratory research.

An extra precaution is the continual checking of the rubber insulation while being applied, to maintain uniform thickness at all times.

High speed automatic machines are used to braid strong, high quality yarn for the cotton jacket, covering the insulation.

All raw materials are carefully tested before going into the manufacture of WIRY JOE CABLE.

Many coats of lacquer (the number depends on the type of cable and its use) are applied in a carefully controlled tower, four stories high.

Wiry Joe . . . the Complete, Quality Line That You Can Sell For Less!

Every year, "Mr. Car-owner" gets a bill for repairs and replacement parts to the tune of something like *three billion dollars*. That's big business! But the retailer who overlooks the fact that the lion's share of this bill is paid by the folks in the so-called lower income group is making a costly mistake.

The sale of ignition and other automotive wiring to owners of used cars reaches a tremendous volume each year. If you are not getting your representative share of it . . . take a critical look at your price structure. You have got to offer reasonable prices if you hope to attract volume sales.

Repair shops, garages, dealers and service stations in every section have found the Wiry Joe Line the answer to this problem. The line covers every automotive wiring need. It is tops in quality on every count . . . yet because of the Dostam Method of manufacturing control and processing, you can sell it for less than other high quality lines.

Get in step with volume sales and make Wiry Joe your automotive wiring line.

Wiry Joe

AUTOMOTIVE WIRING

is produced under the

DOSTAM METHOD

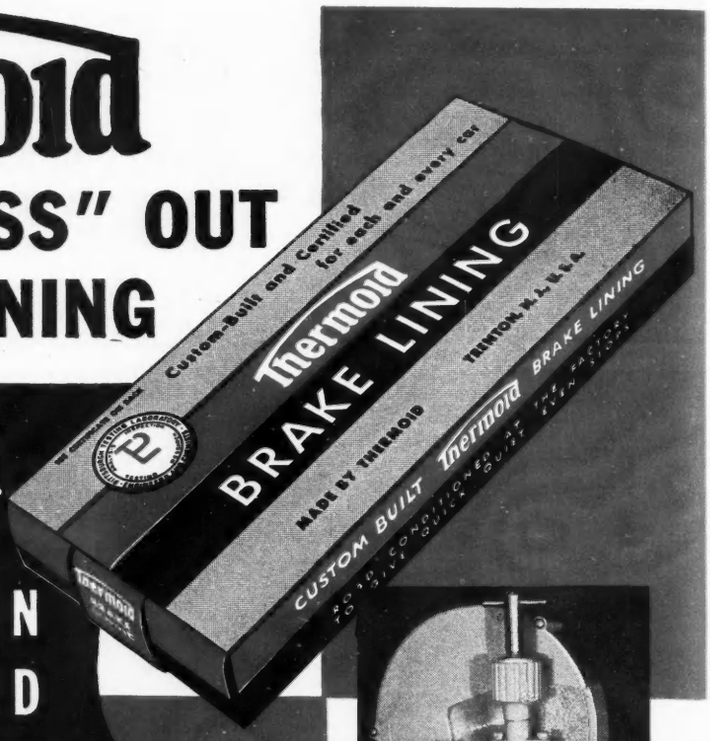
THE CRESCENT COMPANY

PAWTUCKET, RHODE ISLAND, U. S. A.

MONTREAL, CANADA

Thermoid

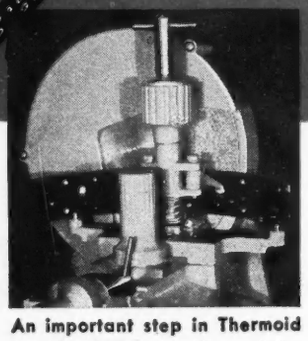
TOOK THE "GUESS" OUT OF BRAKE LINING



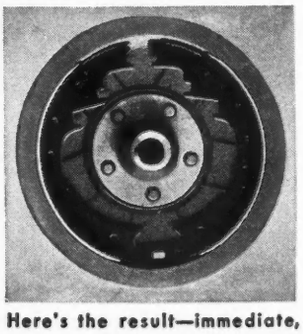
Now Thermoid MAKES

PRECISION PROCESSED BRAKE SHOES

AVAILABLE EVERYWHERE



An important step in Thermoid Precision Processing. Correctly installed Thermoid Brake Lining is burnished to the exact drum diameter, with the shoe mounted on the same points on which it is located on the backing plate.



Here's the result—immediate, perfect 100% lining-to-drum contact. It takes less time to adjust correctly burnished brake shoes, and they give positive, equalized brakes right from the very first brake application.

THERMOID BRAKE SHOE EXCHANGE SERVICE

Thermoid Precision Processed Brake Shoe Exchange Service has brought better service work and higher profits on brake reline jobs to shops in all important metropolitan areas.

The mechanic simply removes the old shoes and exchanges them at the jobber's for completely renewed shoes. These renewed shoes have been checked, chemically cleaned, painted, and relined with Thermoid Custom-Built Brake Lining, certified correct for the particular car by Pittsburgh Testing Laboratory. Finally they have been Precision Burnished to give 100% lining-to-drum contact from the very first application of the brakes.

DEALER'S "PAY-AS-YOU-PROFIT" EQUIPMENT PLAN

In smaller trading areas where Brake Shoe Exchange Service is not available, Thermoid offers a separate Precision Processing plan.

Thermoid will supply the engineering information and equipment for Precision Processing, on a rental-purchase plan that gives you ownership within eighteen months. The monthly cost is so low that you can't afford to pass up the extra profits and business that Precision Processing will bring you.

If Brake Shoe Exchange Service is not available in your area . . . be sure to ask your jobber for the details of this "Pay-as-you-profit" Plan.

Thermoid *Custom-Built* BRAKE LINING SETS

THERMOID CO., TRENTON, N. J.

PARTS NUMBERS AND PRICES

Pontiac Model 40—26HB DeLuxe—6 Cyl.—1940

FRONT SUSPENSION

Part No.	No. Used	Price
503576—Knuckle	2	$6.50
410915—Knuckle support, L.	1	5.00
504058—King pin repair set	1	3.20
503577—King pin	2	.85
503575—King pin bushing	4	.25
230679—Pin thrust brg.	2	.50
230857—King pin lock pin	2	.15
231760—Upper arm pin	2	.50
500863—Pin bush., threaded.	2	.40
1298827—Pin bushing, plain.	2	.35
411817—Pin bushing seal	4	.03
410945—Support arm low. L.	1	5.00
412107—Lower arm pin	2	.60
411147—Lower arm pin bush.	2	.50
411382—Lower pin bush. seal	4	.05
411144—Lower arm shaft	2	2.25
411145—Low. arm shaft bush.	4	.40
411146—Shaft bush. seal	4	.10
504504—Coil spring	2	5.00
264939—Tie rod & ball	2	1.50
264924—Tie rod adjuster	2	.25
264944—End assembly, L.	2	2.00
502023—Knuckle arm, L.	1	1.80
502125—Front wheel, prime.	2	9.00
501998—Front hub & drum, L.	1	9.00
909001—Wheel bearing, out.	2	1.95
909552—Wheel brg. cone, in.	2	1.25
909602—Wheel brg. cup, in.	2	1.15
909702—Brg. ball assem., in.	2	.80
504332—Grease retainer	2	.25
503581—Hub cap	2	1.30

STEERING

265207—Drag link assem.	1	1.75
264946—Ball seat	8	.15
335976—Seat spring	2	.20
265908—Pitman arm	1	1.75
264953—Idler arm	1	1.00
503930—Idler arm bush.	1	.45
263278—Cross shaft	1	6.50
263305—Cross shaft bushing	1	.30
263463—Cross shaft seal	1	.35
263417—Gear housing	1	3.50
264960—Tube and worm	1	5.50
11BC—Worm brg. cone	2	.85
14CE—Worm brg. cup	2	1.05
265870—Jacket tube	1	2.65
264887—Jacket tube brg.	1	.75
504213—Steering wheel	1	7.00

COOLING

3113436—Rad. core assem.	1	34.00
503870—Rad. shell support.	1	9.50
503675—Radiator grille, L.	1	10.00
504734—Rad. grille panel, C.	1	3.75
1510916—Temperature gage.	1	4.50
3108570—Thermostat	1	1.00
501912—Water pump assem.	1	7.50
501182—Pump impeller	1	.75
504996—Shaft brg. & seal	1	2.65
504998—Pump seal	1	.50
501398—Fan blades	1	1.50
500064—Fan belt	1	1.35

FUEL and EXHAUST SYSTEMS

462S—Carburetor assembly.	1	19.00
170M64S—Choke thermostat.	1	2.00
1515371—Gas gage (Dash).	1	1.80
1515481—Gas gage (Tank)	1	1.90
496—Fuel pump	1	*2.50
515—Fuel & vac. pump	1	*4.80
503650—Inlet manifold	1	4.75
503590—Exhaust manifold	1	7.50
500867—Muffler	1	3.75
502774—Tail pipe	1	1.75
502770—Exhaust pipe	1	1.70

ENGINE GASKETS

500372—Carb. to manifold	1	.07
408151—Fuel pump	1	.03
496783—Exh. pipe flange	1	.10
503433—Mani. to block set.	1	.30
502288—Inl. to exh. mani.	1	.10
500687—Cylinder head	1	.90
499668—Cylinder head (spl.)	1	1.80
544351—Oil pan set	1	.40
494663—Main brg. seal (wood)	2	.02
501850—Main brg. packing.	2	.05
499644—Timing case	1	.05
499643—Timing cover set	1	.15
492095—Timing case seal	1	.40
497544—Valve cover	2	.15
494904—Water outlet	1	.02
503539—Water pump to cyl.	1	.03
499887—Water pump cover.	1	.03

ENGINE PARTS

503985—Block with pistons, pins and rings	1	97.50
503571—Cylinder head	1	12.00
503968—Cylinder head (spl.)	1	12.00
501844—Oil pan	1	3.50
501784—Crankshaft	1	36.00
502130—Camshaft	1	9.50
499757—Vibration damper	1	7.50
502151—Flywheel	1	8.25
502153—Flywheel gear	1	2.00

ENGINE PARTS—continued

Part No.	No. Used	Price
503047—Piston & pin	6	$3.50
502815—Compression ring	12	.30
499634—Oil ring	6	.50
497068—Piston pin	6	.55
497067—Piston pin bushing.	12	.15
487461—Pin set screw.	6	.05
502129—Con. rod, less brgs.	6	2.75
502104—Con. rod bearing.	12	.50
499610—Inlet valve	6	.60
499611—Exhaust valve	6	.85
499618—Valve spring	12	.15
526795—Valve spring cage.	12	.10
499598—Valve spring seat.	12	.06
499599—Valve key	24	.05
495462—Inlet valve guide.	6	.25
494876—Exhaust valve guide	6	.25
504227—Valve lifter	12	.60
392167—Valve adj. screw.	12	.10
499678—Timing chain	1	4.50
499606—Crankshaft sprocket	1	1.50
503453—Camshaft sprocket.	1	1.25

MAIN BEARINGS

502134—No. 1	2	.70
502135—No. 2	2	.70
502136—No. 3	2	1.20
502137—No. 4	2	.80

ENGINE OILING

498832—Oil pump assem.	1	6.00
495011—Oil pump body	1	2.50
495012—Shaft & driven gear	1	1.50
497232—Pump drive gear.	1	1.50
525093—Pump idler gear.	1	.90
498821—Relief valve spring.	1	.05

CLUTCH

503783—Housing	1	10.50
503466—Release brg. assem.	1	1.65
501866—Release fork ball.	1	.16
504719—Disk & facing.	1	6.90
503203—Disk facing set.	1	2.65
753410—Pressure plate	1	3.50
753615—Cover & spring.	1	6.75
1314655—Spline shaft	1	9.00
99004—Pilot bearing	1	1.15
47507—Spline shaft brg., R.	1	5.15

TRANSMISSION

1312397—Case	1	11.50
1307848—Countershaft	1	1.00
1394874—CS. bearing set.	1	.50
1310985—CS. gear cluster.	1	11.00
1308377—Mainshaft	1	6.00
7S053—Mnshft. pilot brg.	14	.02
7506—Mnshft. brg., R.	1	4.10
1307764—Low sliding gear.	1	5.00
1314648—Second speed gear.	1	6.00
1307805—Second speed sleeve	1	4.00
1307851—Reverse idler gear.	1	4.80
1314659—Synch. drum	2	2.50
1313679—Cover	1	.50
502489—Gear shift lever.	1	1.50
502497—Control rod	1	.25
502500—Shift control shaft.	1	2.00
504134—Selector rod	1	.35
1312989—Selector shaft	1	.75
503874—Selector shaft lever.	1	.35
1308073—Shifter lever, low.	1	.40
1312407—Shift bar, low.	1	.60
1307864—Shift fork, low.	1	.85

UNIVERSALS

504633—Front yoke assembly	1	4.25
406803—Cross	2	1.25
406829—Cross brg., flange.	4	.90
406828—Cross brg., round.	4	.85
406813—Bearing cork seal.	8	.05
501777—Pinion shaft flange.	1	2.25
504630—Propeller shaft	1	9.25

REAR AXLE

502187—Housing	1	15.00
231969—Cover	1	1.30
231961—Cover gasket	1	.10
502174—Diff. carrier assem.	1	60.00
501825—Diff. carrier & caps.	1	12.00
501958—Diff. carrier gasket.	1	.05
501828—Differential case	1	6.00
501833—Differential pin	1	.75
499503—Differential pinion.	2	1.25
499504—Diff. side gear.	2	3.50
504797—Pinion & ring gear.	1	15.00
501839—Pinion oil seal	1	.50
5306—Pinion bearing, F.	1	7.80
C1509—Pinion bearing, R.	1	3.40
179243—Diff. bearing	2	4.50
412111—Grease retainer	2	.50
502064—Axle shaft, L.	1	7.00
88128—Axle shaft bearing.	2	7.00

REAR SPRINGS

504357—Assembly	2	12.00
502342—Front bolt	2	.20
499533—Spring & brkt. bush.	6	.20
495035—Shackle link, inner.	2	.30
500305—Shackle link, out. L.	1	.50
499538—Shackle pin	4	.20

ELECTRICAL SYSTEM

Part No.	No. Used	Price
647D—Distributor assembly.	1	$8.50
824735—Distributor cap	1	.75
681M—Dist. vacuum control.	1	1.25
1871678—Contact set	1	.70
820445—Rotor	1	.20
1869704—Condenser	1	.40
538Z—Ignition coil	1	2.75
1116285—Ign. switch & cable	1	1.25
1995009—Lighting switch	1	1.25
1997725—Stop light switch.	1	.30
820052—Starter switch	1	.75
1997002—Dimmer switch	1	.50
857886—Tell-tale light	1	1.80
1102665—Generator assem.	1	21.50
1878209—Generator brush	2	.15
1879002—Gen. armature	1	*5.00
812823—Comm. end bushing.	1	.15
3203—Drive end bearing.	1	1.15
1878427—Gen. field coil, L.	1	1.20
1118201—Voltage regulator.	1	6.50
1107022—Starter assembly	1	20.00
1857960—Starter brush set.	1	.30
1867897—Starter armature	1	*4.50
1839345—Drive end bushing.	1	.10
821523—Field coil, L.	1	.90
1873778—Drive housing	1	2.00
1873789—Starter clutch	1	3.50
925000—Sealed beam unit.	2	1.35
504443—Headlamp assembly.	2	11.00
924565—Headlamp door	2	1.25
927023—Rear lamp L. (sedan)	1	2.75
916993—Fender lamp, L.	1	3.50
927055—License lamp	1	2.00
924653—Rear lamp lens	2	.45
5270316—Bat. to switch cable	1	.90
5271257—Bat. ground cable.	1	.50

FRAME and BODY

(4-door sedans in prime)

503663—Front fender, L.	1	22.00
502456—Rear fender, L.	1	9.20
503580—Hood grille	1	7.00
504434—Hood top panel, L.	1	9.00
503915—Hood side panel, L.	1	3.00
4104000—Cowl & dash panel	1	65.00
4104025—Cowl side panel, L.	1	4.00
4081958—Cowl vent. seal	1	.50
4097023—Windshield glass	2	8.95
4099228—Windshield seal	1	3.50
4102033—Instrument panel	1	8.00
4104254—Door, stripped, L.F.	1	27.50
4104178—Door pillar, L. cen.	1	7.50
4091960—Door weatherstrip.	4	1.00
4097027—Door glass, front	2	5.50
4097024—Door vent. glass	2	3.25
4099919—Glass regltr., L.F.	1	2.50
4099392—Vent. regltr., L.	1	1.55
4090545—Vent weatherstrip, L	1	1.15
4091100—Remote control, L.F.	1	.55
4099765—Door lock, L.F.	1	1.75
4091140—Door handle	4	1.65
4091127—Door handle, inside	4	.65
4045914—Door glass run, F.	2	1.25
4099879—Door sill, L.F.	1	2.25
4104112—Quarter panel, L.R.	1	26.00
4091380—Back window glass	1	8.75
4091937—Roof panel	1	44.00
4103619—Trunk lid	1	15.00
4091472—Trunk lid seal	1	2.25
4091786—Rocker panel, L.	1	2.25
4091830—Rear end panel	1	3.25
503557—Frame	1	60.00
503681—Front crossmember.	1	12.00
503568—Running board, L.	1	9.50
503556—Run. brd. apron, L.	1	1.50
503583—Apron molding, L.	1	1.00
503709—Run. brd. mold., L.	1	1.10
501928—Run. brd. brkt., L.F.	1	.25
504158—F. bumper bar, L.	1	3.00
504154—F. bumper bar, C.	2	1.75
504152—F. bumper bracket.	2	1.65
504067—R. bumper face bar.	1	8.00
502034—R. bumper bracket.	2	1.65
1947D—Shock absbr., L.F.	1	*7.15
1116V—Shock absbr., L. R.	1	*3.45

BRAKES

502706—Rear brake cable.	1	3.40
504544—Hand brake pawl.	1	.20
504541—Hand brake sector.	1	.75
501613—Master cyl. assem.	1	*3.75
5450070—Master cyl. cup.	1	.20
231432—Secondary cup	1	.20
5300850—Master cyl. boot.	1	.35
5450213—Check valve	1	.25
5450150—Check valve seat.	1	.15
503234—Wheel cyl., L.F.	1	*1.60
231333—Wheel cyl. cup, F.	4	.20
1409133—Wheel cyl. cup, R.	4	.20
5450031—Wheel cyl. boot.	8	.15
503925—Brake hose, F.	2	1.25
408638—Brake drum, rear.	2	4.00
502333—Lining, primary	4	.75
502334—Lining, secondary	4	.75
502329—Backing plate, F.	2	2.70

*—Exchange price.

Mechanical Specifications

These Specifications Are Brought Up-to-Date Each Month by the

Line Number	MAKE AND MODEL	Lowest Priced 4-D. Sed. (Divd.)	Wheelbase (In.)	Tire Size (In.)	ENGINE: No. of Cylinders, Bore and Stroke	Taxable Hp.	Piston Displacement (Cu. In.)	Maximum Brake HP. at Specified R.P.M.	Compression Ratio (to —1.)	Displacement Factor §	Cylinder Head Material	Camshaft Drive Make	Piston Material	Oil Cleaner Make	Air Cleaner Make	Carburetor Make	Muffler Make	Electrical System Make	Battery Make	CHASSIS: Clutch Type and Make	Gearset Make	Universals Type and Make	Rear Axle Type and Make	Rear Axle Ratio	Front Spring Suspension
1	Bantam.....65	.....	75	4.00/15	4-2.26x3.12	8.17	50.1	22-3800	7.40	....	CI	Own	Als	No	AC	Zen	McK	AL	AL	P.Ro	WG	m-UP	½ Spi	5.25	Tr
2	Buick.....40-40	996	121	6.50/16	8-3 3/32x4 1/2	30.6	248.0	107-3400	6.10	37.0	CI	LB	Ala	AC	AC	S-C	Hay	DR	Del	P.OL	Own	Mp-G-S	½ Own	4.40	IC
3	Buick.....40-50	1109	121	6.50/16	8-3 3/32x4 1/2	30.6	248.0	107-3400	6.10	35.8	CI	LB	Ala	AC	AC	S-C	Hay	DR	Del	P.OL	Own	Mp-G-S	½ Own	4.40	IC
4	Buick.....40-60	1211	126	7.00/15	8-3 7/16x4 1/2	37.8	320.2	141-3600	6.25	39.8	CI	LB	Ala	AC	AC	S-C	Hay	DR	Del	P.OB	Own	Mp-G-S	½ Own	3.90	IC
5	Buick.....40-70	1359	126	7.00/15	8-3 7/16x4 1/2	37.8	320.2	141-3600	6.25	38.8	CI	LB	Ala	AC	AC	S-C	Hay	DR	Del	P.OB	Own	Mp-G-S	½ Own	3.90	IC
6	Buick.....40-80	1553	133	7.50/16	8-3 7/16x4 1/2	37.8	320.2	141-3600	6.25	36.3	CI	LB	Ala	AC	AC	S-C	Hay	DR	Del	P.OB	Own	Mp-G-S	½ Own	4.18	IC
7	Buick.....40-90	1942	140	7.50/16	8-3 7/16x4 1/2	37.8	320.2	141-3600	6.25	37.6	CI	LB	Ala	AC	AC	S-C	Hay	DR	Del	P.OB	Own	Mp-G-S	½ Own	4.55	IC
8	Cadillac-V8...40-60S	2090	127	7.00/16	8-3 1/2x4 1/2	39.2	346.0	135-3400	6.25	40.1	CI	Mor	Ala	No	AC	Str	Wal	DR	Del	P.Long	Own	Nb-Mec	½ Own	3.92	IC
9	Cadillac-V8....40-62	1745	129	7.00/16	8-3 1/2x4 1/2	39.2	346.0	135-3400	6.25	40.5	CI	Mor	Ala	No	AC	Str	Wal	DR	Del	P.Long	Own	Nb-Mec	½ Own	3.92	IC
10	Cadillac-V8....40-72	2670	139	7.50/16	8-3 1/2x4 1/2	39.2	346.0	140-3400	6.70	38.0	CI	Mor	Ala	No	AC	Str	Wal	DR	Del	P.Long	Own	Nb-Mec	½ Own	4.31	IC
11	Cadillac-V8....40-75	2995	141	7.50/16	8-3 1/2x4 1/2	39.2	346.0	140-3400	6.70	38.6	CI	Mor	Ala	No	AC	Str	Wal	DR	Del	P.Long	Own	Nb-Mec	½ Own	4.58	IC
12	Cadillac-V8....40-90	5140	141	7.50/16	16-3 1/4x4 1/4	67.6	431.0	185-3600	6.75	43.1	CI	Mor	Ala	AC	AC	Car	Wal	DR	Del	P.Long	Own	Nb-Mec	½ Own	4.31	IC
13	Chevrolet. Master 85	740	113	6.00/16	6-3 1/8x3 3/4	29.4	216.5	85-3400	6.25	34.0	CI	Var	CI	No	AC	Car	Var	DR	Del	P.Own	Own	Nb-Own	½ Own	3.73	C
14	Chevrolet DL & MDL	766	113	6.00/16	6-3 1/8x3 3/4	29.4	216.5	85-3400	6.25	36.7	CI	Var	CI	No	AC	Car	Var	DR	Del	P.Own	Own	Nb-Own	½ Own	4.11	IC
15	Chrysler.....C-25	995	122½	6.25/16	6-3 1/8x4 1/2	27.3	241.5	108-3600	6.50	36.6	CI°	Mor	Al	Pur	AC	Car	NS	AL	Wil	P.B&B	Own	Cb-UP	½ Own	3.90	IC
16	Chrysler.....C-26	1180	128½	7.00/15	8-3 1/4x4 1/8	33.8	323.5	135-3400	6.80	43.7	CI°	M-W	Al	Pur	AC	Str	NS	AL	Wil	P.B&B	Own	Cb-UP	½ Own	3.91	IC
17	Chrysler.....C-27	.....	145½	7.50/15	8-3 1/4x4 1/8	33.8	323.5	137-3400	6.80	39.9	Al	M-W	Al	Pur	AC	Str	NS	AL	Wil	P.B&B	Own	Cb-UP	½ Own	4.55	IC
18	Crosley.....A	‡362	80	4.25/12	2-3x2 3/4	7.2	38.9	15-4200	5.50	....	CI	For	CI	Pur	AC	Til	Rex	AL	AL	P.Ro	WG	St	½ Spi	5.14	C
19	De Soto.....S-7	945	122½	6.00/16	6-3 1/8x4 1/4	27.3	228.1	100-3600	6.50	37.6	CI°	Mor	Al	Pur	AC	Car	NS	AL	Wil	P.B&B	Own	Cb-UP	½ Own	4.10	IC
20	Dodge.....D-14-17	855	119½	6.00/16	6-3 1/4x4 3/8	25.3	217.8	87-3600	6.50	36.8	CI	Mor	Als	Pur	AC	Str	NS	AL	AL	P.B&B	Own	Nb-UP	½ Own	4.10	IC
21	Ford V8-60.....1940	‡685	112	5.50/16	8-2.6x3.2	21.6	136.0	60-3500	6.60	28.1	Al	Dia	CS	No	Yes	Own	Own	O	Own	P.Os	Own	m-Spi	¾ Own	4.44	Tr
22	Ford V8-85.....1940	‡725	112	6.00/16	8-3 1/16x3 3/4	30.0	221.0	85-3800	6.15	36.2	CI	Dia	CS	No	Yes	Own	Own	O	Own	P.Os	Own	m-Spi	¾ Own	3.78	Tr
23	Graham. DeL. & Cus.	995	120	6.00/16	6-3 1/4x4 3/8	25.3	217.8	92-3800	6.65	....	CI	LB	Als	No	AC	Car	Old	DR	Wil	P.Long	WG	Nb-UP	½ Spi	4.27	C
24	Graham. Sc & Cus. Sc	1130	120	6.25/16	6-3 1/4x4 3/8	25.3	217.8	120-4000	6.65	....	CI	LB	Als	No	AC	Car	Old	DR	Wil	P.Long	WG	Nb-UP	½ Spi	4.27	C
25	Hudson Six & DeL. 6	763	113	(h)	6-3x4 1/8	21.6	175.0	92-4000	7.00	33.5	CI	Ge	Als	No	AC	Car	Old	AL	Nat	Pw.Own	Own	Nb-Spi	½ Own	4.55	IC
26	Hudson. Sup. & CC. 6	870	118-125	(i)	6-3x5	21.6	212.0	102-4000	6.50	35.4	CI	Ge	Als	No	AC	Car	Old	AL	Nat	Pw.Own	Own	Nb-Spi	½ Own	4.11	IC
27	Hudson....8 & CC. 8	952	118-125	(k)	8-3x4 1/2	28.8	254.0	128-4200	6.50	40.9	CI	Ge	Als	No	AC	Car	Old	AL	Nat	Pw.Own	Own	Nb-Spi	½ Own	4.11	IC
28	La Salle.....40-50, 52	1320	123	7.00/16	8-3 1/8x4 1/2	36.4	322.0	130-3400	6.25	40.3	CI	Mor	Ala	No	AC	Car	Wal	DR	Del	P.Long	Own	Nb-Mec	½ Own	3.92	IC
29	Lincoln-V12.....	.....	136-145	7.50/17	12-3 1/16x4 1/2	46.8	414.0	150-3400	6.38	38.5	Al	Mor	Al	Pur	AC	Str	Old	AL	Exi	P.Long	Own	m-Spi	FF Tim	4.58	C
30	Lincoln-Zephyr..1940	‡1400	125	7.00/16	12-2 7/8x3 3/4	39.6	292.0	120-3500	7.20	43.0	Al	Dia	CS	Fram	....	Str	Old	O	Own	P.Os	Own	m-Spi	¾ Own	4.44	Tr
31	Mercury.....1940	‡960	116	6.00/16	8-3.187x3 1/2	32.5	239.0	95-3600	6.15	33.8	CI	Dia	CS	.....	AC	Str	Own	O	Own	P.Os	Own	m-Spi	¾ Own	3.54	Tr
32	Nash-Lafay.....4010	875	117	6.00/16	6-3 1/8x4 3/8	27.3	234.8	99-3400	6.30	36.8	CI	Whit	Als	No	AC	Car	Wal	AL	USL	P.B&B	Own	Nb-Mec	½ Own	4.10	IC
33	Nash...Amb. 6, 4020	985	121	6.25/16	6-3 1/8x4 3/8	27.3	234.8	105-3400	6.00	35.4	CI	Whit	Als	BS	AC	Car	Wal	AL	USL	P.B&B	Own	Nb-Mec	½ Own	4.10	IC
34	Nash...Amb. 8, 4080	1195	125	7.00/15	8-3 1/16x4 1/4	31.2	260.8	115-3400	6.00	35.2	CI	Dia	Als	BS	AC	Car	Wal	AL	USL	P.B&B	Own	Nb-Mec	½ Own	4.10	C
35	Oldsmobile.....60	899	116	6.00/16	6-3 7/16x4 1/8	28.4	229.7	95-3400	6.10	37.8	CI	Whit	Ala	No	AC	Car	Var	DR	Del	P.B&B	Own	Rb-Mec	½ Own	4.11	IC
36	Oldsmobile.....70	963	120	6.50/16	6-3 7/16x4 1/8	28.4	229.7	95-3400	6.10	37.8	CI	Whit	Ala	No	AC	Car	Var	DR	Del	P.B&B	Own	Rb-Mec	½ Own	4.30	IC
37	Oldsmobile.....90	1131	124	7.00/15	8-3 1/4x3 7/8	33.8	257.1	110-3600	6.20	37.2	CI	LB	Ala	No	AC	Car	Var	DR	Del	P.B&B	Own	Rb-Mec	½ Own	4.30	IC
38	Packard.....110	975	122	6.25/16	6-3 1/16x4 1/4	29.4	245.0	100-3200	6.39	40.5	CI	Mor	Als	No	AC	Str	Wal	AL	PO	Ps.Long	Own	Rb-Mec	½ Own	4.11	IC
39	Packard.....120	1146	127	6.50/16	8-3 1/4x4 1/4	33.8	282.0	120-3600	6.41	40.3	CI	Mor	Als	No	AC	Str	Wal	AL	Wil	Ps.Long	Own	Rb-Mec	½ Own	4.09	IC
40	Packard.....160-80	1632	127-38-48	7.00/16	8-3 1/2x4 5/8	39.2	356.0	160-3500	6.45	43.8	CI	Mor	Als	.....	AC	Str	Wal	AL	Wil	Ps.Long	Own	Rb-Mec	½ Own	(b)	IC
41	Plymouth.....P9	740	117½	5.50/16	6-3 1/8x4 3/8	23.4	201.3	84-3600	6.70	34.6	CI°	Mor	Al	Pur	Al	Car	NS	AL	AL	P.B&B	Own	Nb-UP	½ Own	3.90	IC
42	Plymouth.....P10	805	117½	6.00/16	6-3 1/8x4 3/8	23.4	201.3	84-3600	6.70	34.8	CI°	Mor	Al	Pur	Al	Car	NS	AL	Wil	P.B&B	Own	Nb-UP	½ Own	4.10	IC
43	Pontiac 6.....40-25	876	117	6.00/16	6-3 7/16x4	28.3	222.7	87-3520	6.50	38.2	CI	Mor	CNI	No	AC	Car	Var	DR	Del	P.In	Own	Rb-Mec	½ Own	4.30	IC
44	Pontiac 6.....40-26	932	120	6.00/16	6-3 7/16x4	28.3	222.7	87-3520	6.50	37.4	CI	Mor	CNI	No	AC	Car	Var	DR	Del	P.In	Own	Rb-Mec	½ Own	4.30	IC
45	Pontiac 8.....40-28	970	120	6.50/16	8-3 1/4x3 3/4	33.8	248.9	100-3700	6.50	39.8	CI	Mor	CNI	No	AC	Car	Var	DR	Del	P.In	Own	Rb-Mec	½ Own	4.30	IC
46	Pontiac 8.....40-29	1072	122	6.50/16	8-3 1/4x3 3/4	33.8	248.9	103-3700	6.50	38.0	CI	Mor	CNI	No	AC	Car	Var	DR	Del	P.In	Own	Rb-Mec	½ Own	4.30	IC
47	Studebaker. .Champ.	740	.....	5.50/16	6-3x3 7/8	21.6	164.3	78-4000	6.50	38.7	CI	Dia	Ly	No	AC	Car	Wal	AL	Wil	P.B&B	WG	Nb-Spi	½ Spi	4.50	IT
48	Studebaker. Com.10A	965	.....	6.25/16	6-3 1/8x4 3/8	26.3	226.0	90-3400	6.00	39.9	CI	Dia	Ly	Fram	AC	Str	.....	AL	Wil	P.B&B	WG	Nb-Spi	½ Spi	4.55	IT
49	Studebaker. .Pres.6C	1095	.....	6.50/16	8-3 1/16x4 1/4	30.0	250.4	110-3600	6.00	40.9	CI	Dia	Ly	Fram	AC	Str	Old	DR	Wil	P.In	WG	Nb-Spi	½ Spi	4.55	IT
50	Willys.....440	‡545	102	5.50/16	4-3 1/16x4 3/8	15.6	134.2	61-3600	6.48	33.2	CI°	LB	Al	No	AC	Car	McK	AL	AL°	P.R-B	WG	m-UP	½ Own	4.55	C

ABBREVIATIONS—General

°—Others also
*—Measured on rim of Flywheel
(1)—22 on Ford V8, 21 on DeL. Ford V8.
¼—Semi-floating
¾—Three-quarter floating
††—With clearance of .015 the valve is .004 off its seat.
‡—Does not include Federal Taxes
§—Computed on basis of displacement, gear ratio, effective tire diameter, and weight with normal load.

A—Above (rods removed from)
A—After top center
AA—Automatic adjuster
Ad—Advanced **Al**—Aluminum
Ala—Aluminum, Anode processed
Als—Aluminum with struts
Au—Automatic
(b)—3.92—1803-6; 4.09—1804-7; 4.36—1805-8
B—Below (rods removed from)
B—Before top center
(c)—1—1/6, 1—3/32 **C**—Conventional
C—Cold (tappet clearance)

Cb—Cross type with roller bearings
Ch—Chain
CNI—Chrome Nickel Iron
CI—Cast Iron
CS—Cast Steel
(d)—1—5/16, 1—3/32
(e)—0+1/16—0
(f)—1/16 = 1/16—0
F—Floating (piston pin)
(g)—1—3/32, 1—1/6
H—Hot (tappet clearance)
(h)—Six-5.50/16, DeL. 6-6.00/16
(i)—Super. 6.00/16, C.C. 6.25/16

IC—Independent coil
IT—Independent Transverse
(k)—8-6.00/16, C. C. 8-6.50/16
Ly—Lynite
m—Metal with anti-friction bearings
M—Mechanical
Mp—Metal with plain bearings
N—Negative
Nb—Needle bearings
(nn)—N1¾-N2¾
p—Plain bearing
P—Piston (pin locked in)
P—Single plate clutch

Ps—Single plate, semi-centrifugal
Pw—Single Plate, wet
R—Rod (pin locked in)
Ru—Rubber
Rb—Roller bearing type
St—Swivel type torque tube
(t)—½+¾—0
TC—Top Center
Tr—Transverse
Var—Various
x—At 1000 R.P.M.
y—At 2800 R.P.M.

Tune-Up Specifications

Car Manufacturers and Supersede All Others Previously Published

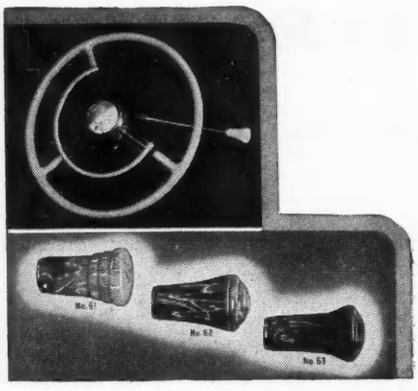
Service Brake Make and Type	Steering Gear Make	Compression Pressure at Cranking Speed (Lbs.)	Spark Plug: Make and Type	RINGS: No. and Width Comp.	RINGS: No. and Width Oil	Piston Pin Diameter	Piston Pin Locked In	VALVES: Head Diameter and Seat Angle: Inlet (Ins.)	Inlet Seat Angle (Degrees)	Exhaust (Ins.)	Exhaust Seat Angle (Degrees)	VALVES: Stem Diameter (Ins.)	VALVES: Operating Tappet Clearance: Inlet	Exhaust	VALVES: Inlet Tappet Clearance for Valve Timing	VALVES: Intake Valve Opens Before or After T. C.: No. of Degrees	No. of Flywheel Teeth	IGNITION: Breaker Points Gap (Ins.)	Spark Plug Gap (Ins.)	IGNITION: Timing: Spark Occurs °TC	No. of Flyw. Teeth Spark Occurs TC	Breaker Housing	Rods Removed From	Crankpin Diameter (Ins.)	Crankpin Length (Ins.)	Capacity Crankcase (Qts.) Dry	Capacity Cooling System (Qts.)	FRONT AXLE: Caster (Degrees)	Camber (Degrees)	Toe-in (Inches)	King Pin Inclination (Degrees)	Line Number
OM	R	135	Ch-H-10	2–$\frac{3}{32}$	1–$\frac{3}{16}$	$\frac{31}{64}$	R	1$\frac{1}{8}$	45	1$\frac{3}{32}$	45	.279	.011H	.012H	.011	19B	.....	.022	.025	4BT	.....	Au	A	1$\frac{1}{4}$	1	3	5$\frac{1}{2}$	15	1$\frac{1}{4}$	$\frac{1}{16}$–$\frac{1}{8}$	1$\frac{1}{2}$	1
BH	S	112	AC-46	2–$\frac{3}{32}$	2–$\frac{3}{32}$	$\frac{15}{32}$	R	1$\frac{17}{32}$	45	1$\frac{11}{32}$	45	.372	.015H	.015H	††	13B	5$\frac{1}{4}$B	.015	.025	4B	1$\frac{1}{2}$B	Au	A	2	1$\frac{7}{32}$	8	12$\frac{1}{2}$	$\frac{3}{8}$±$\frac{3}{4}$	–$\frac{1}{4}$, +1	0–$\frac{1}{16}$	3$\frac{1}{2}$–4$\frac{1}{2}$	2
BH	S	112	AC-46	2–$\frac{3}{32}$	2–$\frac{3}{16}$	$\frac{15}{32}$	R	1$\frac{17}{32}$	45	1$\frac{11}{32}$	45	.372	.015H	.015H	††	13B	5$\frac{1}{4}$B	.015	.025	4B	1$\frac{1}{2}$B	Au	A	2	1$\frac{7}{32}$	8	12$\frac{1}{2}$	$\frac{3}{8}$±$\frac{3}{4}$	–$\frac{1}{4}$, +1	0–$\frac{1}{16}$	3$\frac{1}{2}$–4$\frac{1}{2}$	3
BH	S	114	AC-46	2–$\frac{3}{32}$	2–$\frac{3}{16}$	$\frac{7}{8}$	R	1$\frac{9}{32}$	45	1$\frac{1}{16}$	45	.372	.015H	.015H	††	14B	6B	.015	.025	6B	1$\frac{3}{4}$B	Au	A	2$\frac{1}{4}$	1$\frac{5}{16}$	10	16	$\frac{3}{8}$±$\frac{3}{4}$	–$\frac{1}{4}$, +1	0–$\frac{1}{16}$	3$\frac{1}{2}$–4$\frac{1}{2}$	4
BH	S	114	AC-46	2–$\frac{3}{32}$	2–$\frac{3}{16}$	$\frac{7}{8}$	R	1$\frac{9}{32}$	45	1$\frac{1}{16}$	45	.372	.015H	.015H	††	14B	6B	.015	.025	6B	1$\frac{3}{4}$B	Au	A	2$\frac{1}{4}$	1$\frac{5}{16}$	10	16	$\frac{3}{8}$±$\frac{3}{4}$	–$\frac{1}{4}$, +1	0–$\frac{1}{16}$	3$\frac{1}{2}$–4$\frac{1}{2}$	5
BH	S	114	AC-46	2–$\frac{3}{32}$	2–$\frac{3}{16}$	$\frac{7}{8}$	R	1$\frac{9}{32}$	45	1$\frac{1}{16}$	45	.372	.015H	.015H	††	14B	6B	.015	.025	6B	1$\frac{3}{4}$B	Au	A	2$\frac{1}{4}$	1$\frac{5}{16}$	10	18	0±$\frac{3}{8}$	–$\frac{1}{4}$, +1	0–$\frac{1}{16}$	4–5	6
BH	S	114	AC-46	2–$\frac{3}{32}$	2–$\frac{3}{16}$	$\frac{7}{8}$	R	1$\frac{9}{32}$	45	1$\frac{1}{16}$	45	.372	.015H	.015H	††	14B	6B	.015	.025	6B	1$\frac{3}{4}$B	Au	A	2$\frac{1}{4}$	1$\frac{5}{16}$	10	18	0±$\frac{3}{8}$	–$\frac{1}{4}$, +1	0–$\frac{1}{16}$	4–5	7
BH	S	155x	AC-104	2(c)	2–$\frac{5}{32}$	$\frac{7}{8}$	F	1.88	45	1.63	45	.341	AA	AA	AA	TC	.....	.015	.027	5B	.....	Au	A	2.46	2$\frac{1}{32}$	7	24$\frac{1}{2}$	(nn)	0 to +$\frac{3}{32}$	$\frac{3}{32}$–$\frac{5}{32}$	5° 6′	8
BH	S	155x	AC-104	2(c)	2–$\frac{5}{32}$	$\frac{7}{8}$	F	1.88	45	1.63	45	.341	AA	AA	AA	TC	.....	.015	.027	5B	.....	Au	A	2.46	2$\frac{1}{32}$	7	24$\frac{1}{2}$	(nn)	0 to +$\frac{3}{32}$	$\frac{3}{32}$–$\frac{5}{32}$	5° 6′	9
BH	S	170x	AC-104	2(c)	2–$\frac{5}{32}$	$\frac{7}{8}$	F	1.88	45	1.63	45	.341	AA	AA	AA	TC	.....	.015	.027	5B	.....	Au	A	2.46	2$\frac{1}{32}$	7	24$\frac{1}{2}$	(nn)	0 to +$\frac{3}{32}$	$\frac{3}{32}$–$\frac{5}{32}$	5° 6′	10
BH	S	170x	AC-104	2(c)	2–$\frac{5}{32}$	$\frac{7}{8}$	F	1.88	45	1.63	45	.341	AA	AA	AA	TC	.....	.015	.027	5B	.....	Au	A	2.46	2$\frac{1}{32}$	7	24$\frac{1}{2}$	N1$\frac{1}{2}$–N1	0 to +$\frac{1}{2}$	$\frac{3}{32}$–$\frac{5}{32}$	5° 1′	11
BH	S	180x	AC-104	2(c)	1–$\frac{5}{16}$	$\frac{15}{16}$	R	1.50	45	1.37	45	.341	AA	AA	AA	6B	.....	.015	.032	6B	.....	Au	A	2.00	1$\frac{3}{4}$	11	30	N1$\frac{1}{2}$–N1	0 to +$\frac{1}{2}$	$\frac{3}{32}$–$\frac{5}{32}$	5° 1′	12
OH	O	....	AC-44	2–$\frac{1}{16}$	1–$\frac{3}{16}$	.865	R	1$\frac{41}{64}$	30	1$\frac{13}{32}$	30	.340	.006H	.013H	.006	3B	.....	.021	.040	5B	.....	Au	A	2$\frac{1}{16}$	1$\frac{1}{2}$	5	14	2¼±½	1±½	$\frac{1}{16}$–$\frac{1}{8}$	7°10′	13
OH	O	....	AC-44	2–$\frac{1}{16}$	1–$\frac{3}{16}$	.865	R	1$\frac{41}{64}$	30	1$\frac{13}{32}$	30	.340	.006H	.013H	.006	3B	.....	.021	.040	5B	.....	Au	A	2$\frac{1}{16}$	1$\frac{1}{2}$	5	14	0±½	N$\frac{1}{2}$±½	0–$\frac{1}{16}$	4°45′	14
LH	G	145x	AL-A7B	2–$\frac{1}{16}$	2–$\frac{5}{32}$	$\frac{31}{64}$	F	1$\frac{23}{32}$	45	1$\frac{17}{32}$	45	.340	.008H	.010H	.014	12B	.....	.020	.025	TC	TC	Au	A	2$\frac{1}{16}$	1$\frac{7}{32}$	5	18	N1to+1	0 to +$\frac{3}{32}$	0–$\frac{1}{16}$	4¾–6	15
LH	G	155x	AL-A7B	2–$\frac{1}{16}$	2–$\frac{5}{32}$	$\frac{31}{64}$	F	1$\frac{23}{32}$	45	1$\frac{17}{32}$	45	.340	.008H	.010H	.011	6B	.....	.018	.025	TC	TC	Au	A	2$\frac{1}{16}$	1$\frac{7}{32}$	5	18	N1to+1	0 to +$\frac{3}{32}$	0–$\frac{1}{16}$	4¾–6	16
LH	G	155x	AL-AL7B	2–$\frac{1}{16}$	2–$\frac{5}{32}$	$\frac{31}{64}$	F	1$\frac{23}{32}$	45	1$\frac{17}{32}$	45	.340	.008H	.010H	.011	6B	.....	.018	.025	3B	.....	Au	A	2$\frac{1}{16}$	1$\frac{7}{32}$	6	24	N1to+1	0 to +$\frac{1}{4}$	0–$\frac{1}{8}$	4¾–6	17
HM	R	90	AL-A5	2–$\frac{1}{16}$	1–$\frac{5}{32}$	$\frac{5}{8}$	P	1$\frac{3}{8}$	45	1$\frac{5}{32}$	45	.312	.006C	.007C	.006	20B	5½B	.020	.025	3B	1B	...	A	1½	$\frac{21}{32}$	2	....	6–11	2	$\frac{3}{64}$–$\frac{1}{16}$	6½	18
LH	G	145x	AL-A7B	2–$\frac{1}{16}$	2–$\frac{5}{32}$	$\frac{31}{64}$	F	1$\frac{23}{32}$	45	1$\frac{17}{32}$	45	.340	.008H	.010H	.014	12B	.....	.020	.025	2B	.....	Au	A	2$\frac{1}{16}$	1$\frac{7}{32}$	5	17	N1to+1	0 to +$\frac{3}{4}$	0–$\frac{1}{8}$	4¾–6	19
LH	G	140x	AL-A7B	2–$\frac{1}{16}$	2–$\frac{5}{32}$	$\frac{31}{64}$	F	1$\frac{23}{32}$	45	1$\frac{15}{32}$	45	.340	.008H	.008H	.011	6A	2½A	.020	.025	TC	TC	Au	A	2$\frac{1}{16}$	1	5	15	N1to+1	0 to +$\frac{1}{2}$	0–$\frac{1}{8}$	4¾–6	20
LH	G	150y	Ch-J-10	2–$\frac{3}{32}$	1–$\frac{5}{32}$	.687	F	1$\frac{23}{32}$	45	1$\frac{13}{32}$	45	.279	.013C	.013C	.013	9½B	3½B	.015	.025	4B	1½B	Au	..	1.70	1.41	4	....	4½–9	¼–1	$\frac{1}{16}$–$\frac{1}{8}$	8	21
LH	G	100	Ch-J-10	2–$\frac{3}{32}$	1–$\frac{5}{32}$	.750	F	1$\frac{23}{32}$	45	1$\frac{13}{32}$	45	.310	.013C	.013C	.013	TC	TC	.015	.025	4B	1½B	Au	A	2	1.75	5	22	4½–9	¼–1	$\frac{1}{16}$–$\frac{1}{8}$	8	22
OH	R	120	Ch-H-10	2–$\frac{3}{32}$	2–$\frac{5}{32}$	$\frac{13}{16}$	R	1$\frac{33}{64}$	30	1$\frac{21}{64}$	45	.341	.010H	.010H	.012	8½B	.....	.018	.025	TC	TC	Au	A	2$\frac{1}{16}$	1$\frac{1}{16}$	5	14	3–4	1	$\frac{1}{16}$–$\frac{3}{16}$	7½	23
OH	R	130	Ch-H-10	2–$\frac{3}{32}$	2–$\frac{5}{32}$	$\frac{13}{16}$	R	1$\frac{33}{64}$	30	1$\frac{21}{64}$	45	.341	.010H	.010H	.012	8½B	.....	.018	.025	4½A	.....	Au	A	2$\frac{1}{16}$	1$\frac{1}{16}$	5	15	3–4	1	$\frac{1}{16}$–$\frac{1}{16}$	7½	24
BH	G	125	Ch-J-8-A	2–$\frac{3}{32}$	2(d)	$\frac{3}{4}$	F	1$\frac{5}{16}$	45	1$\frac{5}{16}$	45	.341	.006H	.008H	....	10°2½B	.....	.020	.032	TC	.....	Au	A	1$\frac{13}{16}$	1$\frac{5}{16}$	6	13	0±¼	½±¼	$\frac{1}{32}$±$\frac{1}{32}$	3°38′	25
BH	G	120	Ch-J-8-A	2–$\frac{3}{32}$	2(d)	$\frac{3}{4}$	F	1$\frac{5}{16}$	45	1$\frac{5}{16}$	45	.341	.006H	.008H	....	10°2½B	.....	.020	.032	TC	.....	Au	A	1$\frac{13}{16}$	1$\frac{5}{16}$	6	13	0±¼	½±¼	$\frac{1}{32}$±$\frac{1}{32}$	3°38′	26
BH	G	119	Ch-J-8-A	2–$\frac{3}{32}$	2(d)	$\frac{3}{4}$	F	1½	45	1$\frac{5}{8}$	45	.343	.006H	.008H	....	10°3½B	.....	.017	.032	TC	.....	Au	A	1$\frac{13}{16}$	1$\frac{5}{8}$	9	18	0±¼	½±¼	$\frac{1}{32}$±$\frac{1}{32}$	3°36′	27
BH	S	155x	AC-104	2(c)	2–$\frac{5}{32}$	$\frac{7}{8}$	F	1.88	45	1.63	45	.341	AA	AA	AA	TC	TC	.015	.027	5B	2¼B	Au	A	2$\frac{13}{32}$	2$\frac{1}{32}$	7	25	(nn) (nn)	0–¾	$\frac{1}{32}$–$\frac{3}{32}$	5° 6′	28
OM	O	105	Ch-7	2–$\frac{1}{16}$	2–$\frac{5}{32}$	$\frac{7}{8}$	F	1$\frac{11}{16}$	45	1$\frac{11}{16}$	45	$\frac{5}{16}$	AA	AA	AA	21B	6¾B	.020	.029	7B	2¼B	Au	B	2½	2	12	32	1½	1	$\frac{1}{16}$–$\frac{1}{8}$	7½	29
BH	G	105	Ch-H-10	2–$\frac{3}{32}$	1–$\frac{3}{16}$	¾	F	1.53	45	1.53	45	.311	AA	AA	AA	.....	.....	.015	.029	4B	1¼B	Au	A	2$\frac{1}{8}$	1.57	5	27	4	¾	$\frac{1}{16}$	4	30
BH	G	....	Ch-H-10	2–$\frac{3}{32}$	1–$\frac{5}{32}$	¾	F	1$\frac{17}{32}$	45	1$\frac{17}{32}$	45	.310	.013C	.013C	.013	TC	TC	.015	.025	4B	1¼B	Au	A	2.14	1.75	5	21	4½–9	¼–1	$\frac{1}{16}$–$\frac{1}{8}$	8	31
BH	G	110	AL-B7-A	2–$\frac{1}{16}$	2–$\frac{5}{32}$	$\frac{7}{8}$	F	1$\frac{21}{32}$	45	1$\frac{17}{32}$	45	.340	.015	.015	.015	21½B	6B	.020	.025	TC	TC	Au	A	2	1.42	6	19	0–N½	¼–¾	$\frac{1}{32}$–$\frac{3}{32}$	4½	32
BH	G	125	AC-45	2–$\frac{1}{16}$	2–$\frac{5}{32}$	$\frac{7}{8}$	F	1¾	45	1$\frac{13}{32}$	45	.372	.015	.015H	.015	24½B	7B	.020	.025	6B	½B	Au	A	2	1.42	6	16	0–N½	¼–¾	$\frac{1}{32}$–$\frac{3}{32}$	4½	33
BH	G	110	AC-45	2–$\frac{1}{16}$	1–$\frac{5}{16}$ 1–$\frac{3}{16}$	$\frac{7}{8}$	F	1$\frac{21}{32}$	45	1$\frac{13}{32}$	45	.372	.015H	.015H	.015	20B	6B	.020	.025	9B	¾B	Au	B	2	1.24	7	17	0–N½	¼–¾	$\frac{1}{32}$–$\frac{3}{32}$	4½	34
BH	S	146x	AC-45	2–$\frac{3}{32}$	2–$\frac{3}{16}$	$\frac{31}{64}$	P	1$\frac{9}{16}$	30	1$\frac{27}{64}$	45	$\frac{11}{32}$	.008H	.011H	.012	5B	2B	.020	.040	TC	TC	Au	A	2½	1⅝	5	17¾	0–N¾	N½to+½	$\frac{1}{16}$–$\frac{1}{8}$	4° 51½′	35
BH	S	146x	AC-45	2–$\frac{3}{32}$	2–$\frac{3}{16}$	$\frac{31}{64}$	P	1$\frac{9}{16}$	30	1$\frac{27}{64}$	45	$\frac{11}{32}$	.008H	.011H	.012	5B	2B	.020	.040	TC	TC	Au	A	2½	1⅝	5	17¾	0–N¾	N½to+½	$\frac{1}{16}$–$\frac{1}{8}$	4° 51½′	36
BH	S	152x	AC-45	2–$\frac{3}{32}$	2–$\frac{5}{16}$	$\frac{31}{64}$	P	1$\frac{15}{16}$	30	1$\frac{27}{64}$	45	$\frac{11}{32}$	.008H	.011H	.012	TC	TC	.015	.030	2B	¾B	Au	A	2$\frac{1}{8}$	1⅝	6	21	0–N¾	N½to+½	$\frac{1}{16}$–$\frac{1}{8}$	4° 51½′	37
H	O	....	AC-104 (z)	2(g)	1–$\frac{3}{16}$	$\frac{7}{8}$	F	1$\frac{17}{32}$	30	1⅜	45	.340	.007H	.010H	.012	1B	.....	.020	.028	6B	.....	Au	..	2$\frac{3}{32}$	1¼	5	17	1½±½	(t)	(e)	1°54′	38
H	O	....	AC-104 (z)	2(g)	1–$\frac{3}{16}$	$\frac{7}{8}$	F	1$\frac{21}{32}$	30	1⅜	45	.340	.007H	.010H	.012	1B	.....	.015	.028	8B	.....	Au	..	2$\frac{1}{32}$	1¼	6	18	1½±½	(t)	(e)	1°54′	39
H	O	....	AC-104 (z)	2(g)	1–$\frac{1}{16}$	$\frac{7}{8}$	F	1$\frac{41}{64}$	30	1$\frac{1}{16}$	45	.340	AA	AA	....	4B	.....	.015	.028	5B	.....	Au	..	2¼	1⅜	7	20	N1±½	(t)	(e)	1°54′	40
LH	G	145x	AL-A7B	2–$\frac{1}{16}$	2–$\frac{5}{32}$	$\frac{31}{64}$	F	1$\frac{23}{32}$	45	1$\frac{15}{32}$	45	.340	.006H	.008H	.011	6A	2½A	.020	.025	TC	TC	Au	A	1$\frac{15}{16}$	1	5	14	N1to+1	0to+¾	0–$\frac{1}{8}$	4¾–6	41
LH	G	145x	AL-A7B	2–$\frac{1}{8}$	2–$\frac{5}{32}$	$\frac{31}{64}$	F	1$\frac{23}{32}$	45	1$\frac{15}{32}$	45	.340	.006H	.008H	.011	6A	2½A	.020	.025	TC	TC	Au	A	1$\frac{15}{16}$	1	5	14	N1to+1	0to+¾	0–$\frac{1}{8}$	4¾–6	42
BH	S	156x	AC-45	2–$\frac{3}{32}$	1–$\frac{3}{16}$	$\frac{15}{16}$	P	1$\frac{19}{32}$	30	1$\frac{15}{32}$	45	.310	.012H	.012H	.015	5B	2B	.020	.025	4B	.....	Au	A	2$\frac{1}{8}$	1$\frac{3}{32}$	6	17	N½–N1	0to+$\frac{5}{8}$	0–$\frac{1}{16}$	4⅝–5½	43
BH	S	156x	AC-45	2–$\frac{3}{32}$	1–$\frac{3}{16}$	$\frac{15}{16}$	P	1$\frac{19}{32}$	30	1$\frac{15}{32}$	45	.310	.012H	.012H	.015	5B	2B	.020	.025	4B	.....	Au	A	2$\frac{1}{8}$	1$\frac{3}{32}$	6	17	N½–N1	0to+$\frac{5}{8}$	0–$\frac{1}{16}$	4⅝–5½	44
BH	S	152x	AC-45	2–$\frac{3}{32}$	1–$\frac{1}{16}$	$\frac{15}{16}$	P	1$\frac{19}{32}$	30	1$\frac{15}{32}$	45	.310	.012H	.012H	.015	5B	2B	.015	.025	4B	.....	Au	A	2	1$\frac{1}{16}$	6	19	N½–N1	0to+$\frac{5}{8}$	0–$\frac{1}{16}$	4⅝–5½	45
BH	S	152x	AC-45	2–$\frac{3}{32}$	1–$\frac{1}{16}$	$\frac{15}{16}$	P	1$\frac{19}{32}$	30	1$\frac{15}{32}$	45	.310	.012H	.012H	.015	5B	2B	.015	.025	4B	.....	Au	A	2	1$\frac{1}{16}$	6	19	N½–N1	0to+$\frac{5}{8}$	0–$\frac{1}{16}$	4⅝–5½	46
LH	R	105	Ch-8	2 (c)	1–$\frac{5}{32}$	¾	R	1$\frac{11}{32}$	45	1$\frac{9}{32}$	45	$\frac{5}{16}$	.016C	.016C	.020	15B	5B	.020	.025	1B	½B	...	A	1$\frac{13}{16}$	1½	5	10½	1–2	½	$\frac{1}{16}$–$\frac{1}{8}$	5½	47
LH	R	105	Ch-8	2–$\frac{3}{32}$	1–$\frac{5}{32}$	$\frac{7}{8}$	R	1$\frac{11}{32}$	45	1$\frac{9}{32}$	45	$\frac{5}{16}$	.016C	.016C	.020	15B	5½B	.020	.025	2B	¾B	Au	A	2$\frac{3}{16}$	1⅝	6	14½	N½,+½	½	$\frac{1}{16}$–$\frac{1}{8}$	5½	48
LH	R	105	Ch-8	2–$\frac{1}{8}$	1–$\frac{1}{16}$	$\frac{7}{8}$	R	1$\frac{13}{32}$	45	1$\frac{9}{32}$	45	$\frac{5}{16}$	.016C	.016C	.020	15B	5½B	.020	.025	TC	TC	Au	A	1$\frac{7}{8}$	1$\frac{3}{16}$	8	17	N½,+½	½	$\frac{1}{16}$–$\frac{1}{8}$	5½	49
BH	G	111	Ch-J-8	2–$\frac{3}{32}$	1–$\frac{3}{16}$	$\frac{13}{16}$	R	1$\frac{17}{32}$	45	1$\frac{13}{32}$	45	.371	.014C	.014C	.020	9B	2½B	.020	.030	TC	.....	Au	A	1$\frac{13}{16}$	1$\frac{5}{16}$	4	11¾	3	2	$\frac{1}{16}$–$\frac{1}{8}$	7½	50

MAKES OF UNITS

AC—AC Spark Plug Co.
AI—AC and Industrial Wire Cloth Products
AL—Auto-Lite
BC—Carter and Chandler-Groves
B&B—Borg and Beck
BH—Bendix Hydraulic
BM—Bendix Mechanical
BS—Briggs & Stratton
Car—Carter
Ch—Champion
Del—Delco
Det—Detroit
Dia—Continental Diamond Fiber
Don—Donaldson Simplex
DR—Delco-Remy
Exi—Exide
G—Gemmer
Ge—General Electric Co.
G-S—G.M. or Spicer
Hay—Hayes Industries
HM—Hawley, mechanical
In—Inland
LB—Link Belt
LH—Lockheed hydraulic
Ly—Lynite
McK—MacKenzie Muffler Co.
Mec—Mechanics
Mor—Morse Chain Co.
M-W—Morse and Whitney
Nat—National
NS—Noblitt Sparks
O—Own
OH—Own hydraulic
OB—Own clutch, Borg & Beck disc
OL—Own clutch, Long disc
Old—Oldberg
OM—Own, mechanical
Op—Optional
Os—Own, semi-centrifugal
PO—Prest-O-Lite
Pur—Purolator
R—Ross
R-B—Rockford with Borg & Beck disk
Rex—Rex Engineering Co.
Ro—Rockford
S—Saginaw
S-C—Stromberg or Carter
Spi—Spicer
Ste—Stewart-Warner
Str—Stromberg
Th—Thompson Products
Til—Tillotson
UP—Universal Products
Wal—Walker
WG—Warner Gear
Whit—Whitney
Wil—Willard
(z)—Or Champion
Y—4

Knobs for Steering Column Gear Shift Lever

The latest addition to the line of accessories manufactured by the Sinko Tool & Mfg. Co., 351 N. Crawford Ave., Chicago, Ill., is an assortment of tenite knobs for the remote control steering column gear shift lever. Each knob is 2 in. long, and the assortment consists of three designs in 4 attractive colors. A recessed metal bushing is employed, a special bushing being required to install the knob on the individual car. A 2-color counter display card, die cut to accept the actual knob, is available.



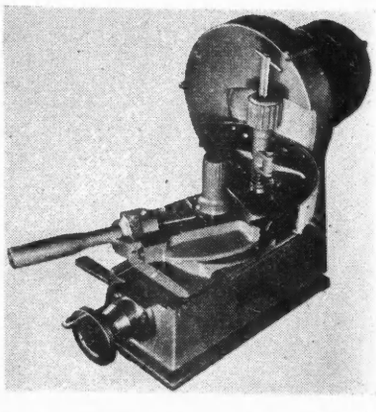
Portable Radio Receiver

A new group of portable radio receivers has been announced by DeWaldo Radio Mfg. Co., 436-440 Lafayette St., New York City. These receivers are powered from self-contained batteries, or from conventional AC:DC current. The flat brief-case type cabinet has the tuning controls located on the top for convenience

and to eliminate the possibility of the knobs being broken while the set is being carried. Cabinets are finished in a durable blue or natural color simulated cowhide leather with contrasting bands of rawhide, and also in simulated alligator leather. The size is 13 in. x 5 in. x 10 in., and weighs slightly less than 14 lbs.

Thermoid Plan Includes Equipment

Dealer's "Pay as you profit" equipment plan introduced by the Thermoid Co., Whitehead Road, Trenton, N. J., is designed for Thermoid retailers in those areas where brake shoe exchange is not available. Dealers may now benefit from the very same kind of precision workmanship at a very moderate investment in equipment. This has been made possible through the development of a new,



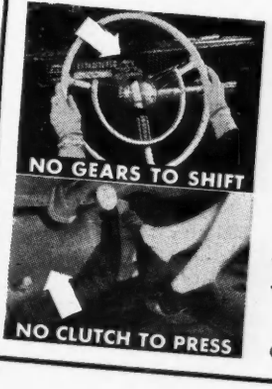
patented Cadet Burnishing Machine on which Thermoid claims the exclusive sales rights, and the completion of arrangements whereby the dealer can get the equipment on a rental-purchase plan that gives him ownership in 18 months Thermoid makes available to the retailer everything he needs to recondition and precision process brake shoes.

"CASH IN" ON OLDS' REPUTATION AS "BEST LOOKING CAR ON THE ROAD!"

"Again the style leader!"..."Best looking car on the road!"... "Smartest version of the newest style!"... these, and opinions like them, you'll hear on every side. For *everyone* recognizes in Oldsmobile the car that's 'way out front in styling—just as it sets the pace in handling ease, riding comfort and performance!

IT'S easy to sell a line of cars that people are sold on in advance. And Olds popularity this year is established beyond the shadow of a doubt. More than 100,000 1940 Oldsmobiles—low-priced Olds Sixties, popular-priced Olds Seventies and medium-priced Custom 8 Cruisers—have already rolled off the production lines. And the spring selling season has not yet really begun! So, why not let Oldsmobile's reputation for leadership in looks, quality and performance promote business for you right now! With Oldsmobile, you have an accepted product, an advantageous franchise and a brand of factory co-operation that gives you real assistance in building, not only for immediate profits, but for soundness and permanence as well. For complete information, write D. E. Ralston, General Sales Manager, Lansing, Michigan.

GREATEST DEMONSTRATION FEATURE A DEALER EVER HAD!



Only Olds offers the sensational new Hydra-Matic Drive. No other car built eliminates the clutch completely—does away with all gear shifting. No clutch to press—no gears to shift! Think what a demonstration feature this gives you—a "natural" for getting more prospects behind the wheel!

HYDRA-MATIC DRIVE

Optional at extra cost on all models.

GO BIG WITH OLDSMOBILE

Repairing Tractors

(*Continued from page* 18)

cars and tractors, enjoyed a steady growth. He told all of his old tractor customers that he wanted their repair work. They knew how well he had taken care of their needs before, and today he has more than 100 farm tractors, all makes, on his list of active accounts. In addition, he has a wide following among farmers and local residents on automobile service. This three-man shop has all the repairing and adjustment service it can turn out.

"Our tractor business," says Mr. Eidenier, "has been a source of good profit ever since we opened our shop here six years ago, but it is growing larger each year, and every factor points to even more rapid development from this time on. Why? There are many reasons. First, the farm labor problem today is serious. Many farmers complain that they cannot find reliable men who will work at any price. Others say they cannot afford to pay the wages demanded—they'd rather stay on Public Works at existing wage scales, fewer hours and easier jobs, than work on farms. Still others report that upon occasion, transients offer their services, but farmers dislike to employ strangers, who may or may not be honest, much less know how to produce a profitable day's work. In any event, they are here today and gone tomorrow.

"This is one basic reason why farmers are thinking in terms of power tractors, and *buying* them increasingly. Tractors which pull one or more plows, harrow or disk the fields for grain planting, cultivating, harvesting, swiftly and more efficiently than they can do it with horses or mules. With his tractor, the full range of lesser implements, plows, harrows, disks, drills, planters, mowers and *combines*, he can prepare, cultivate and harvest every type of crop he raises without hired labor, excepting in the midst of a few days of harvesting.

"But that is not all. The progressive farmer already knows that he cannot compete with other mechanized farms and earn a profit in the old way. And what his less progressive neighbor did not see last year or even this year, will see next year that he, too, must modernize or fail in the race with his more progressive neighbors. Industry is providing the means by which he can modernize through supplying efficient machines at prices within the reach of small, as well as larger farm operators.

"In regard to service *methods*, tractor repairing in our section at least, is entirely different from automobile repair service. Automobiles come, or are brought to the shop. With tractors, we have to take the shop to the field. We have tried every way possible, to persuade farmers to drive their tractors in during the winter months, or any inactive period, for tune-ups, general overhauling and adjustments. But they won't do it. They operate them until they break down, then they want, and must have immediate service. The only way then, is to drive out and make the repairs on the ground.

"This, however, involves no special difficulty and in most instances, no job is too big for us to tackle. With a tonneau full of small tools, wrenches, jacks and supplies, one of us drives right out to the job, in the barnyard, field or wherever the machine is, and starts to work. Only recently we had two major jobs in one forenoon to disassemble and repair rear system. With the skill which comes from practice, one man can turn out this type of job in around 2 hr., including the installation of new parts and reassembly.

"Farmers appreciate this service, as time is a valuable factor with them. Most of them now have electric power, and all repair or adjustment jobs requiring electrical tools such as valve grinding jobs, drilling and so forth, we can plug in our machines and do a first-class job right on the grounds.

"Modern tractors are equipped with the finest type of engines, the high compression type now predominating. Motor tune-ups adjustments and so forth are about in the same proportion as cars, and, due to the more or less rapid accumulation of dust from the fields, require attention in about the same proportion as cars.

"Late this summer we put in an acetylene welding outfit, and are now adding new equipment for our im-

(*Continued on page* 69)

IT'S A LOT SIMPLER THAN CARDS

Anyone who can learn a card game can understand the simple facts about car performance

Car owners are just as interested in getting more out of their cars as they are in playing a better game of cards. And the rules of better car performance are a lot easier to follow.

Get the facts across and you'll make it a lot easier to keep your customers happy. They won't expect you to tune-up their cars for top performance on low quality gasoline. Or complain about "knock" or "ping" when it's the gasoline they buy that causes the trouble.

The chart at the right shows just about all a car owner needs to know . . . the information that Ethyl is helping to drive home to your customers on the radio and in important magazines.

THE HIGHER THE ANTI-KNOCK QUALITY OF GASOLINE...

THE FARTHER YOU CAN ADVANCE THE SPARK TOWARD MAXIMUM POWER *(without knock or ping)*

AND THE BETTER THE PERFORMANCE OF THE CAR

HERE ARE THE SIGNS OF IMPROVED GASOLINE

BETTER — This sign on a pump means that lead (tetraethyl), a liquid, has been added to the gasoline to improve its anti-knock quality. More than three-fourths of all the motor fuel sold today in the United States and Canada is "leaded" gasoline.

BEST — The "Ethyl" emblem means that: The gasoline contains enough lead (tetraethyl) for highest anti-knock, is a dealer's finest motor fuel and the engine's spark can be advanced closest to the point of maximum power and economy.

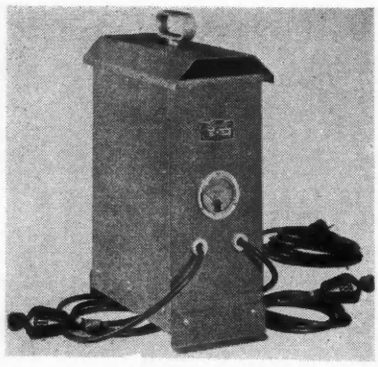
THE BETTER THE GAS—THE BETTER THE CAR

TUNE IN EVERY MONDAY NIGHT — Tony Martin, Andre Kostelanetz and his orchestra, featured on "Tune-Up Time" over coast-to-coast network, Columbia Broadcasting System.

ETHYL GASOLINE CORPORATION, *manufacturer of anti-knock fluids used by oil companies to improve gasoline*

Baldor Announces Quick Charger

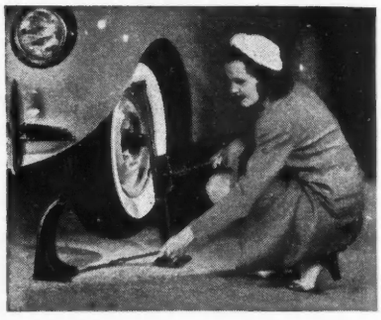
The Baldor Electric Co., 4351 Duncan Ave., St. Louis, Mo., announces the development of their Handy Quick Charger. According to the manufacturer, this new development will charge a 6-volt battery without removing it from the car in about two hours. It is recommended by the manufacturer for service stations, car dealers, repair shops, fleet owners, parking lots, garages, or any other type of business that services automobiles or batteries. Write the manufacturer for Bulletin No. 73.



Baldor Charger

Walker Rim-Lift Jack

The Walker Mfg. Co., Michigan & Hamilton Sts., Racine, Wis., has announced a new rim-lift jack. This jack consists of two units, the jacking unit for lifting and lowering the wheel by placing the jack under the



rim on the outside, directly above the hub cap, and the broad platformed stand to support the load by placing it under either the brake backing plate or under the spring or axle, depending upon the model of jack desired.

Spark Plug Wire Set

A special deal on spark plug wire sets in a low cost combination that services most popular cars has just been announced by Belden Mfg. Co., 4689 W. Van Buren St., Chicago, Ill.

The new combination 7600 consists of 4 spark plug wire sets to service Chevrolet 1929-39, Plymouth 1933-38, Buick 1931-37 and 39, and Dodge 1930-38, and many others. Packed in a special carton, including Belden "OK" cards and a large poster.

Odis A. Porter

Another veteran official whose career dated back to the first 500-mile race at the Indianapolis Speedway in 1911, died last month.

Odis A. Porter, official timer of the International 500-Mile Sweepstakes, succumbed to an illness which caused him to miss his first Indianapolis race last year. An electrical engineer, Porter was clocking speed tests when demand for more accurate records brought about introduction of the electrical timing device in 1915.

Porter, affectionately known as "Father Time" to speed veterans, was official timer for the American Automobile Association, National Aeronautic Association, and the American Power Boat Association. In these capacities Porter timed the outstanding automobile, airplane and motor boat speed tests of the last score of years.

Checking Current

(*Continued from page* 15)

cut-out relay, the current regulator unit and the voltage regulator unit.

* Note: Specifications given herein are for Delco-Remy Models 1118201 and 1118202 (201 and 202). Specifications for other Delco-Remy model regulators are contained in the Delco-Remy Service Manual which is part of the equipment of every Authorized Electrical Service Station of United Motors Service.

Cut-out Relay

To check the setting of the cut-out relay, connect voltmeter from the "gen" terminal of the regulator to the regulator base. Slowly increase the generator speed.

Cut-out relay should close between 6.2 and 6.7 volts.

To adjust, bend up on the spring post (see Figure 3) to increase the spring tension and the closing voltage. Bend down to decrease the closing voltage. For complete readjustment of the cut-out relay, two mechanical checks and adjustments are required, air gap and point opening.

Air gap should be .020 in. Check by moving the armature down until the points just close (regulator must be disconnected!) and then measuring between the winding core and the armature. If both sets of points do not close at the same instant, bend the spring fingers until they do. Adjust the air gap by loosening the two adjusting screws, and raising or lowering the armature as required.

Point opening shoud be .020 in. and is adjusted by bending the upper armature stop.

Current Regulator

To check the setting of the current regulator, bridge the voltage regulator points from the frame to the upper point support with a jumper lead, and connect an ammeter into the charging circuit at the "bat" terminal as shown in Figure 4. Since the voltage regulator is now inoperative, turn on the lights, radio, heater and other accessories to prevent high voltage in the system. Operate the generator at a medium speed and note the current reading on the ammeter, which is the current regulator setting.

The current setting should be 34 amperes with the unit at operating temperature. Do not attempt to make this check and adjustment with the regulator cold. It must be at operating temperature.

Adjust by bending the spiral spring hanger of one spring (Figure 5). Bend down to increase the current setting, bend up to lower the setting. Normally, sufficient range of adjustment can be made on one spring only, and the other spring will not have to be touched. However, when the unit is badly out of adjustment, it will be necessary to remove one spring entirely, adjust the remaining spring to 17 amperes, re-install the second spring, and complete the adjustment to 34 amperes entirely on this spring alone. This insures that each spring will carry one-half the total tension and the armature will be balanced.

The air gap should be .080 in. and is measured between the center of the core and the armature with the points just touching. (See Figure 6.) A convenient way of adjusting the air gap is to loosen the two contact mounting screws, insert the correct gage between the center of the winding core and the armature and hold the armature down against it.

Move the contact mounting bracket up or down as necessary until the points just touch. Make sure the points are lined up properly, and tighten the screws well after adjustment.

Voltage Regulator

To check the setting of the voltage regulator, disconnect the "bat" terminal lead, and connect voltmeter and a ¾ ohm fixed resistance from this "bat" terminal to the regulator base, as shown in Figure 7. Operate the generator at a medium speed and note the voltage setting which should be 7.2 to 7.4 volts, with the unit at operating temperature. The regulator must be at operating temperature when the voltage setting is checked and adjusted.

Adjust by bending the spiral spring hanger of one spring (Figure 5). Bend down to increase the voltage setting, bend up to decrease the voltage setting. It is very important, after each adjustment, to always replace the regulator cover, reduce the generator speed until the cut-out re-

(*Continued on page* 69)

LEGALLY SPEAKING

by C. R. ROSENBERG, JR.

A lawyer's interpretation of Federal and local court decisions of interest to repairmen, presented each month

Impulsive Employee

A CUSTOMER in a service establishment expressed dissatisfaction to the employe who was serving him and threatened to complain to the proprietor. The employe then struck the customer so severely that the customer had to be taken to the hospital where his head was dressed and a number of stitches taken in his scalp. Later the customer sued the proprietor of the place for the injuries.

Ruling that the employer was legally responsible for the employe's act, the court said:

"An employer may be held responsible for assaults committed by an employe while he is acting within the scope of his employment, even though he may act wantonly and contrary to his employer's instructions. The employer may not escape liability either on the ground of the employe's infirmity of temperament or because, under the influence of passion aroused by the customer's threat to report his complaint, he went beyond the ordinary line of duty and inflicted the injury."

Employer's Check

MANY repairmen, as a matter of convenience, give bookkeepers or other employes authority to issue and sign checks for payroll, accounts payable and other business purposes. Now suppose such an authorized employe signs and uses a check to pay a personal obligation. What redress does his employer have?

The person who receives such a check from the employe can see at once that the employe is paying his personal obligation with his employer's money and, according to a recent pronouncement of the Supreme Court of Colorado, is bound to inquire into the employe's right to do so. If he neglects to do so, the person whom the employe pays with his employer's check may be required to repay the money to the employer.

But the employing repairman must act promptly. In the Colorado case an employe signed and used several of his employer's checks to pay his house rent. The employer did not question the validity of the first check received by the employe's landlord until 18 months after the landlord got it. This long silence on the part of the employer, the court ruled, justified the landlord in believing that the employer had sanctioned the use of his checks by the employe to pay his personal obligation. Hence the landlord was permitted to keep the money.

"Speaks for Itself"

"THE thing speaks for itself" is a legal doctrine that sometimes may be unpleasantly applied to repairmen.

A customer walked into a business building and while there was injured by the falling of a block of plaster from the ceiling. He sued the business man whose business was operated in the building. The court agreed that the business man was legally and financially liable for the customer's injuries on the theory that "the thing speaks for itself."

Assume that the thing which causes a customer's injury is under the repairman's control and that the accident is of a kind that ordinarily does not happen if the thing in question

has been given proper care and attention. When a customer is injured under such circumstances, the law says that "the thing speaks for itself" and presumes that the accident would not have happened except through the negligence of the repairman in failing to exercise the necessary "due care" of the thing that caused the accident.

The repairman gets his chance to show that the accident was not caused by any neglect on his part, but if the thing that resulted in an injury to a customer is absolutely under his control, he has pretty hard going before court and jury.

Incidentally, there have been a number of cases in different States in which business men have been required to compensate customers and others for injuries caused by plaster falling from walls and ceiling. The rule that "the thing speaks for itself" has been applied rather generally to injuries caused by falling objects in stores, shops and other business places.

Outside Competition

LOCAL license requirements are not always effective to protect home town business men from outside competition. A salesman can "work" a town, deliver goods there, and safely ignore the town's license ordinances, provided he can show that his business is interstate. At least, that was the outcome of a Minnesota case recently.

There a door-to-door salesman was convicted of violating a city ordinance requiring such salesmen to obtain a city license. He appealed his conviction, which was set aside on the ground that he was engaged in interstate commerce and hence not subject to a city tax or license.

The salesman lived in Minnesota and took orders in a city of that state for future delivery of goods located in Wisconsin. The goods were shipped by railroad from Wisconsin to the salesman, who opened the original shipping cases and placed the goods on shelves in his home. Then he would place the goods in a truck, deliver them to his customers and collect for them.

This method of doing business, said the court, was "interstate commerce" and therefore could not be "burdened" by making the salesman pay a city license tax.

Loaned Goods

OFTEN a repairman is urged to install a piece of equipment or other item in his place "on trial" or "demonstration." The idea is that the prospective seller of the item loans it to him without obligation in the hope that he will eventually buy it. Usually the understanding is that he is to return the item when requested.

Such a transaction is called a bailment. The owner is the bailor and the repairman to whom he turns over the item temporarily is called the bailee. Now suppose that the item is stolen or destroyed by fire while in the repairman's possession as bailee. Is he legally and financially responsible for the loss?

He is if the loss occurred as a result of his failure to take reasonable care of the goods. But if he can show that he took proper care of the item, and that it was lost by fire or theft in spite of his care, he is not liable.

"The bailee must show," said an Illinois court recently, "that the fire or robbery was not due to his carelessness, and that he has exercised the degree of care called for by the nature of the bailment. The bailee is bound to take reasonable care to protect the bailor from loss. Reasonable care in such a case is such care as a bailee is bound to exercise in the preservation of property entrusted to him, and such as every prudent man takes of his own goods in like character."

Other people's goods in a repairman's possession are entitled to reasonable care and protection. But he is not responsible for their loss by fire or theft if the disaster was not the result of any carelessness on his part.

Jenkins to Relieve Jenkins

There probably will be a Jenkins at the wheel of the "Mormon Meteor" every second of the super-speed run on Bonneville Saltbed this summer . . . even if Ab seeks all the records up to 48 hours of continuous driving.

In the stack of applications for race driver licenses received at headquarters of the American Automobile Association Contest Board in Washington, D. C., was one from Marvin Jenkins. Marvin, who recently became of age, is the son of Ab Jenkins, America's No. 1 speed record holder.

Those close to the Jenkins activities say Marvin will in all probability act as relief driver for Ab when Salt Lake City's new record-holding mayor takes to the salt flats again this summer.

Marvin cut some fancy capers at the wheel of the "Mormon Meteor" last summer while Ab was having a breathing spell from his record ride. Of course, Marvin did not compete officially for records for he was not licensed and was under age at that time.

Those who have seen Marvin drive predict that the Jenkins name will continue in the super-speed headlines for many years to come—even after Ab has hung up the goggles to devote all of his time to politics.

New AC Spark Plug Plant

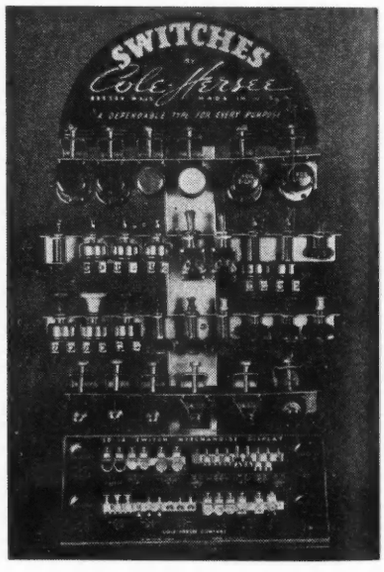
Immediate construction of a large new spark plug plant in Flint by the AC Spark Plug division of General Motors is announced by L. Clifford Goad, president and general manager. The new plant will comprise 156,000 sq. ft. of floor space, equivalent to nearly four acres. The new plant will be adjacent to the company's other factories.

McCord Appoints Imhoff

The appointment of W. E. Imhoff to the position of sales manager of the replacement parts division of McCord Radiator & Mfg. Co. has been announced by W. G. Hancock, McCord general sales manager. As sales manager of the replacement division, Mr. Imhoff will supervise sales to automotive jobbers of McCord gaskets, oil seals, mufflers, radiators, and car heaters.

Switch Merchandiser

A new switch merchandiser, SD-14, has been announced by Cole-Hersee Co., 54 Old Colony Ave., Boston, Mass. It contains an assortment of 34 switches suitable for all kinds of in-



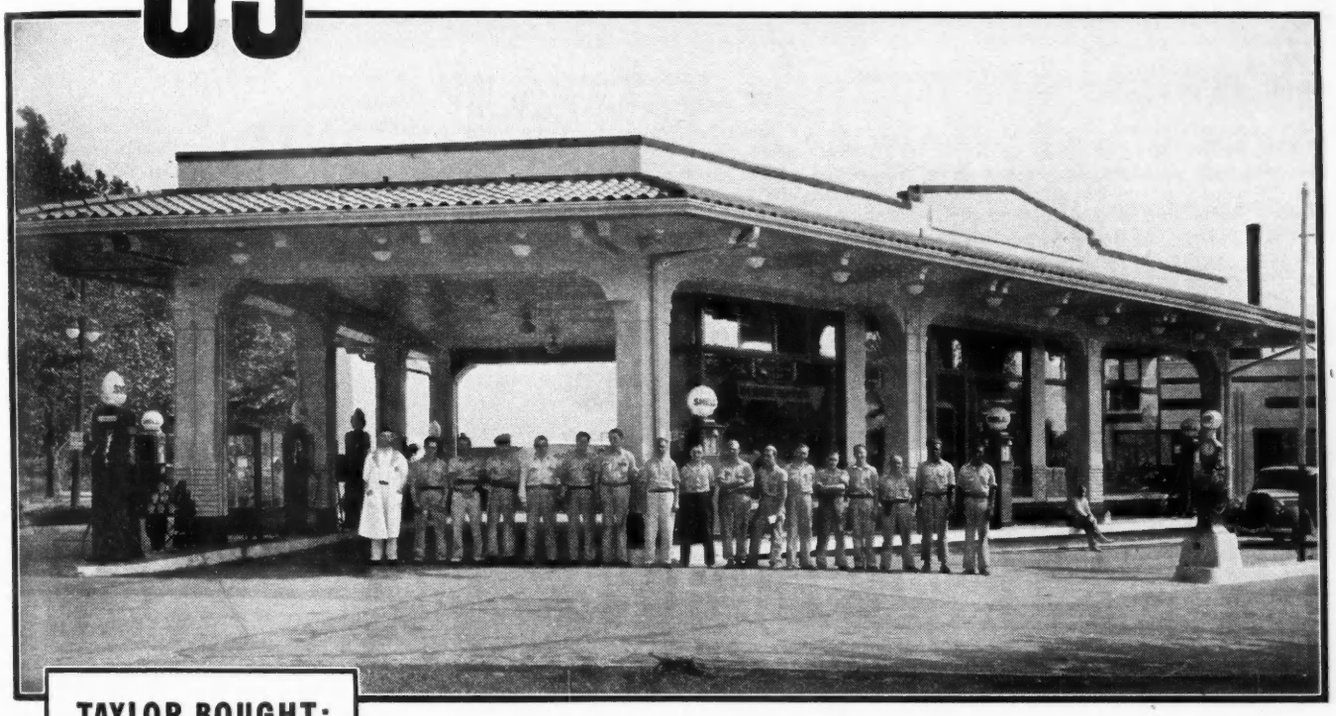
stallation. Attached to the bottom of the display is a chart indicating the assortment provided, so that instant replacement can be made when switches are sold.

Barrett Brake Lining Filler and Cement

The Barrett Equipment Co., 2741 Washington Blvd., St. Louis, Mo., have announced a new "Prescription" brake lining filler which they claim is superior to other various types of fillers now on the market.

This new cement is the result of years of experimenting, and dries practically as soon as the lining is in place, providing a non-resilient and extremely hard surface, filling up all uneven places between the brake lining and shoe the manufacturer states. It is being furnished in pints, quarts and gallons.

An 85% INCREASE In Business



TAYLOR BOUGHT:

A gas analyzer, battery tester, motor tester, coil and timing tester, light tester, vacuum cleaner and motor flusher.

•

Equipment from four manufacturers thru *one* jobber, on *one* contract, with *one* down-payment . . . the AEP way.

AUTOMOTIVE EQUIPMENT TIME PAYMENT PLAN

INSURANCE INCLUDED

S. A. Taylor owned a service station at Georgia Avenue and Upshur St., Washington, D. C.

He was selling his normal quota of gas, oil and other small items, and doing pretty well. But competition began to grow sharper and as usual in such cases, competitors began to offer discounts to increase gallonage. Just the old cut-price racket, at which everybody loses. Mr. Taylor decided that the way to beat it was to make his a "one-stop" station, offering every type of desirable service to car owners in his territory. To carry out his idea meant the immediate purchase of additional new equipment.

He consulted his jobber, got the cost figures, found out that the AUTOMOTIVE EQUIPMENT PLAN would enable him to buy on a sound, economical time payment basis with only a moderate first-cost, and a convenient schedule of monthly payments.

He bought. He attracted a lot of new customers. He won an 85% increase in service and repair business in the first 10 months, as well as a healthy increase in gas gallonage.

You, too, can do this. You can start small and build big. Just call in your jobber, plan your equipment purchasing, and be *sure* you buy on AEP terms.

COMMERCIAL CREDIT COMPANY

Commercial Bankers

WHAT NEW EQUIPMENT WOULD BRING YOU THE BIGGEST RETURNS?

MAIL THE COUPON NOW!

Let us tell you how to get it through AEP—Small initial outlay—monthly liquidation—ample time—low cost—fully insured—one contract.

COMMERCIAL CREDIT CO., Baltimore, Md.

Send me full details. What local jobbers offer AEP terms?

Name_____

Address, City & State_____

Factory Smoke

(Continued from page 42)

400,000 miles of 24-hour a day service. It is a 1936 model owned by the New Jersey state highway department.

Throughout three solid years of almost constant operation, says the company, the car traveled 405,405 miles to establish an operating record of 16.7 miles per gallon of gasoline. Cost per mile of the unit to taxpayers was 1.5 cents, of which .07 cents was allowed for depreciation. Minor overhaul jobs were performed each year and one complete overhauling was given the car after it had completed more than a year and a half of service, with a total of 287,000 miles. Per mile cost figures were given as follows: gasoline—.73 cents; oil and grease—.07 cents; tires and tubes—.13 cents; parts—.13 cents; repair labor—.37 cents; and depreciation—.07 cents.

* * *

Willys, too, is convinced that its cars are built to stand up under long punishment. The company is willing to bet on it—in fact, Willys has just announced that it will guarantee its passenger cars and commercial vehicles for a period of three years or 100,000 miles, whichever comes first. The new warranty follows in general the terms of the guarantee which has been in use for several years by practically all manufacturers. It assures the Willys owner that he will be protected against defects in materials and workmanship for the long period. Excepted, of course, are trade accessories.

* * *

Concurrent with the recent Detroit convention of the Automotive Equipment Association were two meetings held by Electric Auto-Lite Co. Among the subjects under discussion was what was described as the most ambitious advertising and sales promotion plans in Auto-Lite history—including the comprehensive use in 1940 of newspaper and magazine advertising, outdoor posters and other forms of sales promotion.

* * *

Extensive new research facilities have been added in recent months to Ford's engineering test grounds, where nearly 5,000,000 miles of research runs were completed last year. A mud pit, water pit, sand pit and a skid test section are among the recent additions. The "rideometer," a new instrument added to the many at the test ground, measures the vertical, horizontal and pitching motion of cars over different road surfaces at varied speeds. It consists of a light beam, a pendulum, and a reel of film on which the motions of the car are recorded. The film is timed to measure the frequency of spring movements.

* * *

The drama of sound, hard-hitting sales tactics, as applied to the automotive industry, is vividly portrayed in the latest Stewart-Warner Alemite talking motion picture, "It Takes More Than a Recipe to Bake a Cake." Produced from the original script by Fred R. Cross, Alemite retail sales manager—his third Alemite production in the last two years—the premiere showing of the film was made recently before the Stewart-Warner distribution organization at its 24th annual convention.

New Barrett Brake Drum Hone

The Barrett Equipment Company's new Brake Drum Hone, which provides a superior finish to brake drums after they have been machined, is now being added to the standard equipment furnished with all Barrett Brake Drum Lathes at no extra cost.

The manufacturer advises, however, that the one is available separately to operators of all lathes and retails for $12.50 for the cast iron honing set, or $22.50 for the cast iron and steel model. All models of these hones are universal in their application and fit all makes of lathes.

Thermoid Sales Reward Plan

Inauguration of a sales reward premium plan by Thermoid Co. has created widespread interest among service men, the company reports. Operation of the plan is simple. Each time the dealer sells a Thermoid belt, he removes a coupon printed on the back of the sleeve. A catalog gives a wide assortment of premiums.

Midget Line Up for '40 Season

Two promoters who recently withdrew their midget automobile races from supervision of the American Automobile Association's Contest Board are again flying the AAA banner in the revised midget campaign of the three "A."

William Heiserman and John Kochman have agreed to include their events in the newest schedule of vest-pocket races sanctioned by the AAA in the eastern states. These promoters were among six who notified the Contest board that in 1940 they would supervise their own events. Those who were said to have signed the withdrawal notification (revealed in January MOTOR AGE) and who are not named in the new set-up are: Ralph DePalma, Walter C. Stebbins, Harry J. Ryan, Walter Secrist.

Prior to their withdrawal, the promoters had operated 17 midget races weekly under AAA supervision.

Under the readjustments of Contest Board activities in the midget field, a schedule of 14 races per week has been announced and others are promised. The schedule calls for two circuits of seven events each. They are known as the "red" and "blue" circuits with a system for interchanging drivers and cars to keep fan interest at its peak. One race in each circuit will be allowed to each track operating two races weekly.

Eight tracks are listed in the revised AAA midget set-up.

Insisting that it will continue to branch out in its supervision of midget racing, the Contest Board has added a full-time midget race supervisor to its salaried staff. Ferdie Arrigoni, who resigned Dec. 31, 1939, as eastern zone supervisor of activities of the Central States Racing Association, has been assigned to the new midget post by the AAA.

The speed fraternity generally feels that hiring of Arrigoni by the AAA is a forecast of a strong battle for top supervision in the midget field between the AAA and CSRA. These two governing groups has attempted to outbid each other for support of the fraternity ever since the CSRA was created some four year ago. Only a year ago plans for renewal of a working agreement between the two supervising boards "blew up."

Extending its present activities in the midget field, the AAA says it has completed a western New York schedude to embrace Buffalo (N. Y.) Stadium; Niagara Falls, N. Y.; Rochester, N. Y.; Erie, Pa. Syracuse, N. Y., is also expected to join the circuit.

Following is the schedule set by the AAA. This does not include the western New York circuit, for which dates must yet be established by the governing board.

Sunday (night)	Dorney Park, Allentown, Pa.
Sunday	Tri-City Stadium, Newark, N. J.
Monday	Hershey Stadium, Hershey, Pa.
Monday	Thompson Stadium, Staten Island, N. Y.
Tuesday	Castle Hill Speedway, Bronx, N. Y.
Tuesday	Freeport Stadium, Freeport, Long Island
Wednesday	Tri-City Stadium, Newark, N. J.
Wednesday	Baker's Field, Philadelphia, Pa.
Thursday	Hershey Stadium, Hershey, Pa.
Thursday	Newfield Park, Bridgeport, Conn.
Friday	Castle Hill Speedway, Bronx, N. Y.
Friday	Freeport Stadium, Freeport, Long Island
Saturday	Baker's Field, Philadelphia, Pa.

Note—One more event for the week is to be added. It is a Saturday night date to be selected from applicants. Operating these tracks are: S. F. "Red" Crise (who operated under CSRA sanction last year), operating Hershey Stadium, Freeport Stadium, Dorney Park, and jointly promoting Tri-City Stadium with John Kochman; and Baker's Field with Kochman and R. Fabiani; William Heiserman, promoting Castle Hill and Newfield Park; R. Streeter, R. Meyer and T. Lyman, promoting Thompson Stadium.

New Indicator by Anderson

A battery condition indicator is the latest product of the Anderson Co., 957 Garfield St., Gary, Ind. The device, known as the Charge-Master, shows the performance of the generator, the load on the electrical system and the condition of the battery itself. Available in two types which fit all 6-volt systems, the unit is easily fastened on the bottom of the instrument panel of any car.

Tractors

(*Continued from page 54*)

proved machine shop to take care of the increasing tractor demands. We do not carry parts, as these are available from our automotive supply jobber. We get a good margin of profit on these parts, and thus far, have been able to supply our customers in a highly satisfactory manner."

Not only has Eidenier found tractor repairing profitable, but a prime necessity to maintain the volume of service required for a growing business. In the broad scheme developed by the harvester and tractor producers to build efficient tractors in the low priced field, he sees even greater opportunities in the early years ahead, when every farm will own and operate one or more tractors as well as a car, service truck and trailer.

Checking Current

(*Continued from page 59*)

lay contact points open, and then bring generator back to speed before taking the voltage reading. Normally, bending one spring will give sufficient range for adjustment, and the other spring will not have to be touched. However, when the unit is badly out of adjustment, a special adjustment procedure must be followed to insure that each spring will carry one-half the total tension.

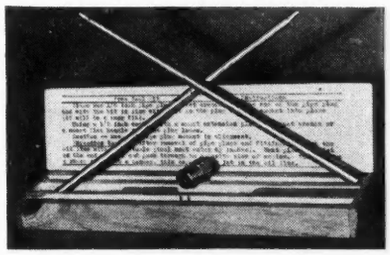
1. Remove one spring.
2. Connect voltmeter from the "gen" terminal to the regulator base.
3. Open voltage regulator points by hand and slowly increase generator speed until the voltmeter reads about 2.5 volts.
4. Release armature and adjust the setting to between 3.5 and 3.7 volts.
5. Install the second spring and complete adjustment on it entirely to volts.

The air gap of the voltage regulator should be .075 in., and is adjusted in exactly the same manner as for the current regulator. (See Figure 6.)

By following the simple procedure outlined here, you will be able to handle service on any of these new regulators which come your way. With good instruments and the proper gages, you will find the approved checking and adjusting procedure easy to follow.

Tools to Install Cam Bearing Metering Jets

The Blaisdell Mfg. Co., 1312 Gaviota Ave., Long Beach, Calif., makers of a camshaft bearing oil metering jet for metering the flow of oil to the camshaft bearing, has developed a set of tools to aid in the installation of this part. The tool kit consists of



two expansion tools and a pipe plug socket wrench. This socket wrench is designed to be used with any socket wrench set, and is to remove the slotted pipe plug entering the oil lines in the side of the Chrysler built engines. The expansion tools are for inserting the metering jet in place, and spreading it to hold it in position.

YANKEE PUMPER

Red Rolfe, Yankee third baseman and one of this year's holdouts, is shown as he pumps gas at his filling station in Penacock, N. H. Red is asking for $18,000 from the Yanks for this season, a raise of $3000.

Oversize Crankcase Drain Plugs

The popular reception of the No. 949 Champ-Items Self-Threading Crankcase Oversize Drain Plugs in ½ in. O.S. size has caused the manufacturer to add ⅝ in. and 11/16 in. oversize plugs to this line. The Champ-Items No. 949A is ½ in. O.S. for Chevrolet '28-'40; Oldsmobile '39-'40 and Pontiac '33-'40. List 25c. each. The No. 949B ⅝ in. O.S. for Buick '38-'40; Hupmobile '35-'36; and Packard '35-'40, and the No. 949C 11/16 in. O.S. for Buick '29-'37; LaSalle '28-'40, and Oldsmobile '31-'38. List 30c. each. The manufacturer states these are real Re-conditioning Short Cuts and prove life-savers when the crankcase drain plug threads are stripped, saving both time and labor. No drills or taps required. Furnished with special fiber gasket. For further information, write Champ-Items, Inc., St. Louis, Mo.

ITCHY?

. . . then pay a visit to the Wildwood Service Station in Birmingham, Ala. Marvin Branch, owner of the station, offers this back-scratching post as a novel attraction. Note that the post has an appropriate scratching place for men, ladies, children and even dogs.

Drefs New Director of MEMA

Notification has been received of the election of Arthur G. Drefs, vice-president and treasurer of the McQuay-Norris Manufacturing Co., as a director in the Motor & Equipment Manufacturers Association with headquarters at New York. With his election to the Board of the Motor & Equipment Manufacturers Association, Drefs has the unique honor of being the first individual in the automotive industry who has concurrently served on the boards of directors of all three parts manufacturing associations, namely:— The Automotive Parts & Equipment Manufacturers Association, The National Standard Parts Association and The Motor & Equipment Manufacturers Association. Drefs is also a trustee of The Automotive Safety Foundation.

Connecting Rod Bearing Sizer

The Sunnen Products Co., 7910 Manchester Ave., St. Louis, Mo., announces a new rod bearing sizer which quickly and accurately bores any size bearing insert up to 4 in. in length and up to 3½ in. in diameter. Bearing inserts can be bored either in or out of the rod. Rebabbitted bearings can also be bored with the Sunnen rod bearing sizer. Designed for use with the Sunnen Bushing Grinder, the combination makes a practical arrangement because one machine will handle the rod bearing work and also piston pin and king pin fitting, hydraulic brake cylinder reconditioning and other small hole work.

3-WAY PROFIT PLAN WITH MOTO-SCOOT

- *120 MILES PER GALLON*
- *35 MILES PER HOUR*

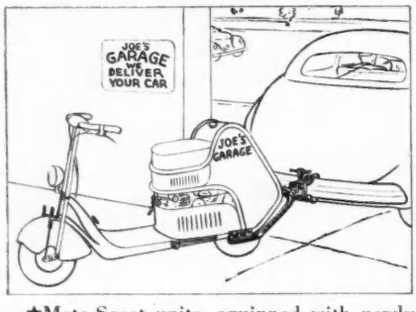
RENTAL OPERATORS:—

★Here's the new streamline form of recreation that will click in your locality. Moto-Scooting is healthy exercise, offering young and old a chance to get out and enjoy the parks and highways. Moto-Scoots travel up to 70 miles a day at a cost of less than 10¢. Rentals are similar to bicycles, but much more profitable. Get an early start this year in a real money-making business. Write for complete details.

Dealers:—

★Moto-Scoot dealers increase profits with the fastest moving, low-cost transportation units ever offered. Pioneering an industry that is rapidly assuming a major position in the transportation field, Moto-Scoot and its entire dealer organization is forging ahead to new sales records.

MOTO-SCOOT WITH TOW BAR FOR DELIVERING CARS



★Moto-Scoot units, equipped with newly perfected tow bar, slash labor and fuel costs in delivering automobiles; also eliminate the necessity of an extra car and driver. Moto-Scoot automobile delivery service keeps grease and wash racks busy for service stations, garages and repair shops. Attach and detach in less than a minute.

——→ Check below and return for free descriptive literature and information as to which plan you are interested in

☐ RENTALS ☐ TOW BAR
☐ DEALERSHIP

Name .....

Address .....

City ..... State .....

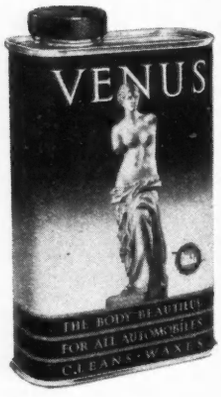
MOTO-SCOOT MFG. CO.
8400 So. Chicago Ave.
Chicago, U. S. A.

DEFIER

Fred Perkins, owner of a backyard battery plant at York, Pa., defies state and Federal governments to collect social security and unemployment compensation taxes for his six workers, who are paid from $16 to $20 a week. Perkins' trucks are now interned in the post office garage pending a government sale, at which he expects to buy his own trucks back. The $40 cost of the sale will be added to the Internal Revenue Collector's $105 claim. Original taxes, not including extras, were only $94.92. Says Perkins, "I am in favor of an old age benefit tax, but I hold it should come from those who get it back."

Venus Auto Polish

The Whiz automobile polish division of the R. M. Hollingshead Corp., Camden, N. J., announces a new automobile polish which will be marketed under the trade name of Venus. It is claimed that this new polish cleans and waxes in one easy operation, contains no abrasives but depends upon a special film softening agent that eliminates hard rubbing.



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Don't Accept Less

Valley Battery Chargers quickly repay their low first cost in added profits to your shop. Guaranteed for two years.

Model G-12 charges 1 to 12 6-volt batteries

NOW ONLY $25.00

Other sizes at equally low prices. Write for FREE bulletin.

Valley Electric Corp.
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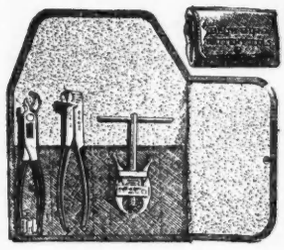
BATTERY SERVICEMEN Prefer and Choose BLUE BIRD SERVICE TOOLS

Cut time costs and increase your profits with quality tools for specific tasks.



An efficient combination of SUPERIOR Battery Tools that insures Ease, Speed and Better Connections, assembled in a Leatherette Kit Bag.

No. 375—3 Piece Kit contains one each
No. 11 Hex Nut Plier & Post Cleaner
No. 20 Clamp Spreader & Cleaner
No. 21 Universal Clamp Lifter
Price: $3.00 Postpaid East of Rockies
$3.75 Postpaid West of Rockies

No. 375 KIT *Illustrated*

No. 385—4 Piece Kit contains one each
No. 52 Super Grip Plier
No. 20 Clamp Spreader and Cleaner
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Price: $3.10 Postpaid East of Rockies
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Jobbers—Write for catalog & proposal

BERGMAN TOOL MFG. CO.
Niagara St., Buffalo, N. Y.

ALL-MISCIBLE
The Only Brake Fluid Engineered Expressly for REFILL USE

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The finest warning signal made—Musical, but powerful—instant Response, but delicate when desired.

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